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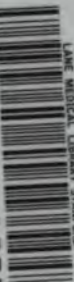
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THE
AMERICAN YEAR-BOOK
OF
MEDICINE AND SURGERY

BEING

A Yearly Digest of Scientific Progress and Authoritative
Opinion in all Branches of Medicine and Surgery
drawn from Journals, Monographs, and Text-
Books of the Leading American and Foreign
Authors and Investigators

COLLECTED AND ARRANGED

WITH CRITICAL EDITORIAL COMMENTS

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UNDER THE GENERAL EDITORIAL CHARGE OF

GEORGE M. GOULD, M.D.

SURGERY

PHILADELPHIA, NEW YORK, LONDON

W. B. SAUNDERS & COMPANY

1904

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PREFACE.

IN the department of Pediatrics the subscriber will be glad to find that Dr. J. P. Crozer Griffith and Dr. J. Claxton Gittings have consented to serve as editors. They succeed Dr. Louis Starr and Dr. Alfred Hand, Jr., who have resigned. Drs. H. F. Hansell and Wendell Reber have found it impossible to continue in charge of the department of Ophthalmology, and Dr. Walter L. Pyle and Dr. Samuel Horton Brown have undertaken the editorship. I am also happy to have the aid of Dr. John Marshall and Dr. John H. W. Rhein in editing the literature of Legal Medicine. These new editors of departments are so well known as masters in their respective specialties that the reader will feel assured of the best workmanship and judgment. Grateful acknowledgment of indebtedness is due to the previous editors for their zeal and the excellence of their work; I regret that other duties have made their resignations necessary. We also regret the resignation of Dr. M. B. Hartzell from the section on Cutaneous Medicine and Syphilis. This department remains under the sole charge of Dr. Louis A. Duhring.

A special endeavor has been made this year, and will be continued in the future, to place at the head of each chapter a summary of the more noteworthy advances and discoveries made during the year. These, we are assured, will prove of use to the reader in fixing in the attention the special trends of progress in such a vast mass of literature as appears each year in every branch of medical science. The ever-increasing difficulty of gathering this to a focus has its compensation in the continued and increasing success of the YEAR-BOOK, despite many formidable rivals.

GEORGE M. GOULD.

PHILADELPHIA, *January, 1904.*

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GENERAL SURGERY.

By J. CHALMERS DACOSTA, M.D., AND JOHN H. GIBBON, M.D.,
OF PHILADELPHIA.

SURGICAL TECHNIC.

Senn¹ describes the preparation of catgut by the Claudius method, stating his satisfaction in the use of gut so prepared. The commercial raw catgut is soaked in a 1 % solution of iodine for 7 days. It is claimed that this makes the catgut aseptic and also imparts to it antiseptic qualities. The practical results obtained from the use of iodized catgut show that no irritation of the tissues results from its presence, probably because the iodine is converted into potassium and sodium iodids by chemical combinations formed with the salts of the tissues. To those surgeons so situated that they cannot properly sterilize the catgut by the more complicated methods this procedure is especially recommended. The author states that the results of experiments being conducted in the Rush Medical College for determining the bactericidal power of iodine will be published later.

A. W. Mayo Robson² describes a simple and effectual method of sterilizing catgut, which consists in placing the ordinary commercial formalin catgut of desired size and strength in metal cylinders of requisite size and which are furnished with impervious screw covers, and filling the remaining space with xylol. The cylinder is then boiled for half an hour, which is sufficient to thoroughly sterilize the material. After this treatment the catgut is stored in a 5 % carbolic acid solution in methylated spirit. Catgut prepared in this way keeps indefinitely. Robson uses the gut out of the $\frac{1}{2}$ $\frac{1}{10}$ carbolized spirit.

Edgar R. McGuire³ reports from the surgical clinic of Dr. Roswell Park a careful experimental study to determine the best method of hand sterilization, and particularly to estimate the value of antiseptics in hand disinfection. His conclusions, based upon his experiments, are as follows: "(1) Absolute sterility of the hands is impossible by any method. (2) There is no royal road to sterilizing the skin—nothing takes the place of long and vigorous mechanical scrubbing. (3) The longer the hands are scrubbed under aseptic precautions, the nearer the approach to sterility. (4) The use of antiseptics on the skin is, at least, questionable; under the usual conditions it is distinctly harmful. (5) When the true value of antiseptics is understood we will

¹ Jour. Am. Med. Assoc., March 28, 1903

² Brit. Med. Jour., Sept. 27, 1902.

³ Amer. Med., Feb. 28, 1903.

have cleaner hands, due to more conscientious scrubbing. (6) The use of rubber gloves, while not ideal, is the nearest approach to it. (7) The operator whose hands perspire freely ought to wear gloves in every case, regardless of all objections to them."

Robert T. Morris¹ discusses **rubber gloves in surgery**, and thinks that the advantages of using them have been greatly exaggerated. He believes that wounds are frequently infected from the atmosphere, and therefore urges rapid work and small incisions. He believes that the use of rubber gloves interferes with the tactile sense and consequently with the work of the surgeon. Rubber gloves distinctly have their place in surgery and should be used in cases of diabetes and whenever the hands have been seriously infected.

Nancrede and Hutchings² present a further study regarding the **sterilization of catheters**, and offer a modification of their former conclusions. [See YEAR-BOOK OF SURGERY, 1903.] They present the following, based upon additional experiments: "(1) Although the washing with warm soapsuds is an absolute prerequisite to most methods of chemical sterilization and is an excellent precaution, in the method of employing caloric we recommend, it is not necessary, as shown by Experiments 84 to 91, where no difference was observed in the time and thoroughness of sterilization when this precaution was omitted, when compared with Experiments 78 to 83, where previous washing was done. (2) One of the chief obstacles in the way of catheter sterilization has always been the oily lubricants. The boiling temperature promptly liquefies the vaselin usually employed, which will be seen floating upon the surface of the fluid mechanically carrying away with it numerous germs mingled or adherent to the cold, semi-solid lubricant. (3) In our first paper we showed that the English catheter was more readily sterilized than the soft-rubber instruments, and, what is of greater importance, can be repeatedly boiled without material damage, if proper precautions are taken. (4) Experiment 65 (first paper) shows that the English web catheter can be boiled for any length of time without damage in a saturated solution of ammonium sulfate. As this boils at 104° C. it is superior to plain water, but subsequent washing in sterilized water is requisite to remove the crystals of the salt which are deposited on cooling. (5) The only precautions requisite in boiling English catheters in plain water are those necessary to prevent their coming directly in contact with the bottom of the vessel in which they are boiled—this can be done by enveloping them in gauze or a towel. (6) Finally, these numerous experiments incontestably prove that caloric can be successfully employed for all varieties of catheters with the exception of the soft French instrument, provided all air is expelled from the interior; that this essential having been secured, although in a great majority of cases 5 minutes' immersion in water which is actually boiling will suffice, 10 minutes of actual ebullition should be employed, especially for the smaller calibered instruments; and that a previous cleansing with warm soapsuds is desirable, although not essential, reducing as it

¹ N. Y. Med. Jour., Nov. 22, 1902.

² Med. News, Jan. 10, 1903

does the time of exposure requisite to sterilize the instruments. As previously stated, the employment of a saturated solution of ammonium sulfate is desirable for English catheters, but is not essential, and detracts from the simplicity of the method."

Stewart McGuire,¹ in considering **drainage after abdominal section**, describes an original method of drainage which combines the advantages of the Penrose and the Fowler drains. It consists of a soft-gum tube surrounded by numerous strands of cordine, both enclosed in a thin rubber protective. The rubber protective does not extend so far as the cordine and the cordine does not extend so far as



Fig. 1.—Various drains used after abdominal section: 1, Mikulicz's; 2, Penrose's; 3, McGuire's; 4, Fowler's; 5, Koeberle's (McGuire, in *Virginia Med. Semi-Monthly*, Nov. 21, 1902).

the gum tube. It is small in size and hence does not interfere with the closure of the wound. It is also soft and flexible and does not become adherent. The cordine gives the maximum capillary drainage and can be removed in part or wholly without taking out the entire drain.

John W. Keefe² has employed Downes' **electrothermic angiotribe** (Fig. 2) for the purpose of producing **hemostasis** in 50 operations, mostly abdominal, and states that since November, 1902, he has not used a ligature in the abdominal cases operated upon in his gynecologic service. He is greatly impressed with the utility of the instrument, and thinks it will largely take the place of the ligature. In none of the cases in which it was used was there any secondary hemorrhage. One

¹ *Virginia Med. Semi-Monthly*, Nov. 21, 1902.

² *Boston M. and S. Jour.*, June 18, 1903.

of the operations was an amputation of the thigh, and the control of the femoral after the use of the instrument was perfect. The instrument was used also in operations upon the stomach and intestinal tract. Its greatest advantage is that it does away with the use of the ligature and minimizes the dangers of infection.

The accompanying illustration (Fig. 4) represents a hot-water mattress designed by George W. Crile¹ for the purpose of keeping a patient

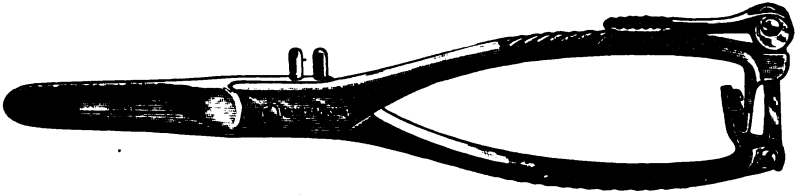


Fig. 2.—Downes' electrothermic angiotribe (Keefe, in Boston M. and S. Jour., June 18, 1903).

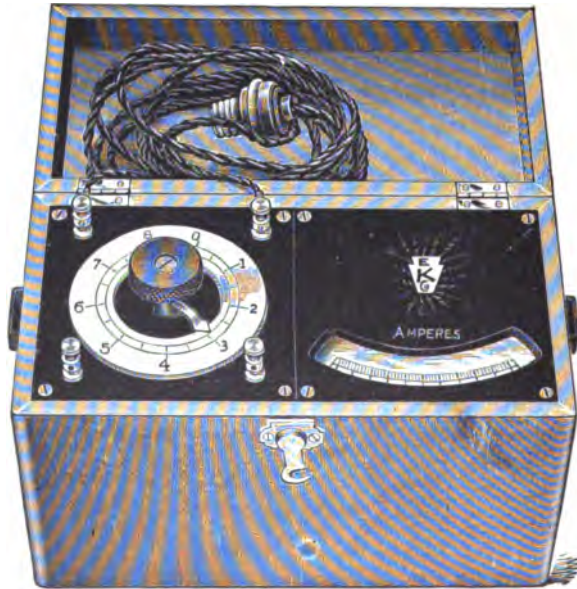


Fig. 3.—Alternating current transformer (Keefe, in Boston M. and S. Jour., June 18, 1903).

warm during an operation. The mattress is placed upon the operating-table and hot water is allowed to flow through it for half an hour before the patient is placed upon the table. It is unnecessary longer to continue the passage of the hot water, as after the mattress and table have been thoroughly warmed they will remain so for an hour or more.

Pollard² describes a **short rubber drainage-tube** for drainage of

¹ Ann. of Surg., June, 1903.

² Lancet, Oct. 18, 1902.

the **pleural cavity**. The tube is just long enough to penetrate the cavity and is held in place by two flanges—a narrow one on the inner

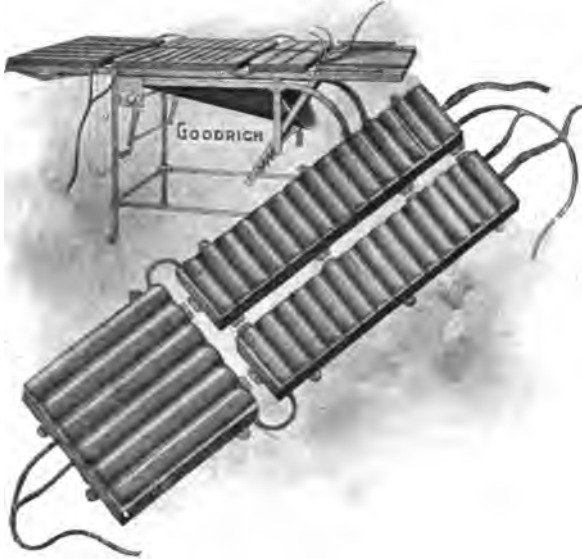


Fig. 4.—Hot-water mattress for operating-table (Crile, in *Ann. of Surg.*, June, 1903).

extremity to prevent the tube from coming out, and a much larger one on the outside to prevent its going into the pleural cavity. These tubes are made in a number of different sizes. The accompanying illustration (Fig. 5) renders more elaborate description unnecessary.

AMPUTATIONS.

Estes¹ presents a further contribution to the study of modern amputations, adding to his former table of 340 major amputations, 194 additional ones performed during the past 8 years. His experience in this second series has strengthened his conviction that whenever there is the least possible chance of preserving a useful limb or a part

of a limb which may be of service, careful antisepsis should be practised, hemostasis assured, and the operation be deferred for from 30 to 40 hours, at which time all doubt regarding the preservation of the part will be removed. Conservative excisions and ligations should be practised rather than amputations when at all applicable. Estes states that

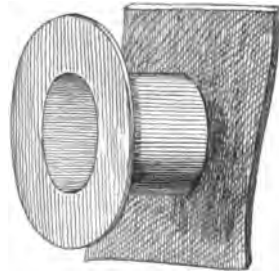


Fig. 5.—Rubber tube for drainage of the pleural cavity (Pollard, in *Lancet*, Oct. 18, 1902).

¹ *Amer. Med.*, Nov. 29, 1902.

he has seen numerous limbs which would have been classed as hopeless, preserved and recover almost complete usefulness after a conservative plan of treatment. The chief points in regard to saving life after severe injuries which require amputation are the control of the bloodvessels and the practice of careful disinfection. Practically all of the amputations which Estes has done have been for injury, and in most of these cases the damage was of the worst character. After severe crushes of the lower extremity he has found that amputations in the upper third of the thigh are almost as fatal as hip-joint amputations. In hip-joint amputation he practises the dissection method.

A. W. Morton¹ reports a case of **hip-joint amputation under medullary narcosis**. The method proved entirely satisfactory, the patient suffering no pain.

The **avoidance of shock in major amputations by cocainization of large nerve-trunks preliminary to their division**, with observations on blood-pressure changes in surgical cases, is the subject of an interesting paper by Harvey Cushing.² The mechanism of shock and its prevention are discussed at some length, and may be briefly summarized in the three following paragraphs, which form the preface to the article:

"1. By common usage the term 'shock' has come to represent a peculiar state of depression of the normal activities of the central nervous system. Such a condition is ordinarily brought about by traumatism, of one sort or another, to peripheral afferent nerves. In order to produce shock, the impulses resulting from this traumatism must have acted reflexly upon the vasomotor mechanism in the medulla in such a way as to occasion a marked fall in blood-pressure. This diminution of arterial tension is the most characteristic symptom of shock.

"2. Under ordinary circumstances injuries of only moderate severity to peripheral nerves cause a rise in blood-pressure. If, on the other hand, these injuries are extensive or frequently repeated, or if they are complicated by certain primary or secondary anemias, they are commonly productive of a fall in blood-pressure, indicating a state of shock. Shock consequently need not be occasioned even in most extensive surgical procedures on the extremities, provided due regard is given to perfect hemostasis. In operations of considerable magnitude, however, during which the division of many large nerve-trunks becomes necessary, or in operating upon such traumatic cases as have been already complicated by extensive injury to peripheral sensory nerves, so-called operative shock is rarely avoided. When, therefore, any condition is existent which predisposes to shock, such as loss of blood, prolonged anesthesia, etc., or when a certain degree of shock is already present before operation, especial risk is attendant upon the division of important sensory nerve-trunks.

"3. Cocain injected into a nerve-trunk effectually blocks the transmission of all centripetal or sensory impulses. Cocainization, therefore, of main trunks of nerves central to the proposed site of their division

¹ Pacific Med. Jour., Feb., 1903

² Ann. of Surg., Sept., 1902.

in a major amputation, prevents the conduction of those impulses resulting from the traumatic insult which otherwise, by acting reflexly through the medullary centers, might become the chief factors in the production of shock."

Illustrating the principle put forth in the foregoing paragraphs, Cushing relates 2 cases of interscapulothoracic amputation, one of which was done without cocainization of the large nerve-roots and the other done after antecedent cocainization of the nerves. In both instances hemostasis was thorough. Except for the difference in the operative technic, the cases were in every respect similar. Two charts recording the pulse-rate are here reproduced (Figs. 6 and 7) which show distinctly the point which Cushing wishes to emphasize, namely, that in the case in which the nerves were divided without cocainization there was a marked increase in pulse-rate, indicating shock, whereas in the other case in which the nerves were cocainized there was a fall of pulse-rate after the division of the nerves. Cushing also calls attention to the fact that in extensive operations where no large nerve-trunks are divided, shock may be avoided by careful hemostasis, and refers, as an illustration of this statement, to the performance of the complete Halsted operation for carcinoma of the breast. Although this is one of the most extensive operations of present-day surgery, providing there is no loss of blood shock is rarely occasioned. In operative cases, however, in which it becomes necessary to divide large bundles of nerves, precautions other than the avoidance of the loss of blood seem to be demanded. To Crile is given the credit of bringing the attention of the profession to the method of blocking the efferent impulses by the intraneural injection of cocain. This method has been extensively employed to produce regional anesthesia in operations upon the extremities and in hernia. The method advised by Crile in amputations precludes, of course, the possibility of employing the time-honored methods of amputating, necessitating, as it does, the employment of gradual dissection. The author states that "the tourniquet and long amputating-knives are practically relegated to disuse." Regarding the employment of the tourniquet, it is said: "Should the tourniquet be used in amputations, I believe that its application distal to the site of amputation has more rationale than the usual proximal method of employing it. It may thus be applied as an Esmarch bandage either after the ligation of the main arterial vessel or before beginning the operation, its purpose being to prevent the loss of blood into the extremity." Regarding **amputations for traumatism**, it is stated that these principles apply in a degree almost greater than in pathologic cases. "Here a state of shock may already be present, and the attendant ordinarily is advised to wait for some hours, during which time a readjustment of conditions is expected to take place and the severity of shock to diminish. As a matter of fact, the very conditions are present which tend to perpetuate or to increase the already existent degree of shock. Such an increase is brought about by a continuation of afferent sensory impulses. The tourniquet itself, which has been applied at the time of the accident,

lowering of blood-pressure. Strychnin, intravenous infusion, even though there may have been but slight loss of blood, and delay, are the usual measures advocated for such states. I believe they are, if not actually harmful, certainly not helpful. The real indication is to rid the patient of the centripetal impulses, originating in the crushed member, by cocainization and division of the large nerves, so often exposed in a mangled limb, by ligation of vessels if necessary, and the earliest possible removal of the painful tourniquet. Under proper management, with possible strapping of the abdomen to hold up the blood-pressure, with morphin in small amounts to control restlessness, and with a proper avoidance of those conditions which during the operation would increase shock, I believe that it is no heresy to advocate ether anesthesia (never chloroform) and early operation for most cases of severe traumatism of the extremities." Although the pulse-rate is an index to the blood-pressure, it is not an accurate index, and when the blood-pressure is to be definitely recorded an apparatus should be employed. By the use of this apparatus in the operating-room Cushing states that he has been able to anticipate and to avoid profound states of shock and collapse. The latter portion of his paper is devoted to the records of the variations in blood-pressure occurring during the performance of certain operations, and is illustrated by the reproduction of a number of charts.

A case of interscapulothoracic amputation for sarcoma of the brachial plexus is reported by Lund.¹ Before resorting to amputation in this case Lund attempted to remove the growth by dissection, but because of the involvement of the axillary vessels, especially the vein, which was torn, the operation had to be abandoned. The vein was repaired by sutures and its caliber restored. Some time later, when the growth had greatly increased in size and the patient had made up his mind to accept the operation, the entire upper extremity was removed. Lund employed the plan of removing about 2½ inches of the middle of the clavicle with a chain-saw in order to expose and tie the subclavian vessels. Each cord of the brachial plexus was also injected with 10 minims of a 0.25 % solution of cocain, as suggested by Crile, and divided. The pulse was unaffected by this procedure. The operation was then completed without hemorrhage or other difficulty. The author states that after the ligation of the subclavian artery and vein, which should be carefully done and in the order named, the operation is simple enough. This case is interesting, aside from the operation, in that there was a close relationship between the development of the tumor and the injury to the arm. The early paralysis of the median nerve and the fact that this nerve and the cords which form it were actually involved in the growth, while the other nerves of the brachial plexus were affected simply by pressure, point probably to the tumor as of primary origin in the median nerve.

¹ Boston M. and S. Jour., April 16, 1903.

TETANUS, SEPTICEMIA, GANGRENE, ETC.

Luckett¹ reports 2 cases of tetanus successfully treated by the subarachnoid injection of antitetanic serum. The conclusions of his article are as follows: "(1) As no attempt was made to maintain an equation between the amount of spinal fluid withdrawn and the amount of serum injected, that the shock or collapse so often observed following spinal subarachnoid injection of cocain for anesthesia is not due to an upsetting of the equilibrium of the pressure in the spinal canal, as is claimed by the advocates of this method of producing anesthesia, but is due solely to the physiologic action of the cocain. (2) Given a wound infected with tetanus, I am by no means positive that the anatomic seat of the wound does not play an important role in the production of the constitutional symptoms of tetanus, for, again accepting the present view of the pathogenesis of tetanus, any wound infected with tetanus near a large nerve will be more likely followed by constitutional effects of the infection than a wound anatomically remotely removed from the seat of a large nerve. It is possible, therefore, that the space in the palm of the hand, between the first and second metacarpal bone, is a favorable point for an infection of tetanus to produce constitutional effects, because the median nerve in the hand becomes flattened out and much larger at this point; it therefore offers an increased surface with greater facilities for gathering and conveying the toxins to the cord. (3) While I recognize the absurdity in trying to draw conclusions from 2 cases, the reaction after each injection was so prompt, and improvement so positive, and followed by final cure in both grave cases, that I am constrained to state that I believe in the spinal subarachnoid injection of the tetanus antitoxin, preceded by the withdrawal of the active, concentrated, highly toxic spinal fluid, supplemented by forced nutrition and proper care of wound, we have at least the promise of a method of treatment of tetanus by means of which we can offer more hope in this fatal and rightly most dreaded disease than we have been able to, heretofore."

Gideon Wells² presents a statistical article on **Fourth of July tetanus** which shows that in a number of large cities the number of cases occurring in July as compared with other months is enormous. The high mortality of this disease throughout the country at this season is also shown by the figures presented. It is urged that the physician undertaking the treatment of the blank cartridge wound should look upon it as a most dangerous injury, and remember that when properly treated at the beginning it is almost without danger. Therefore the responsibility for bad results lies with the man who first treats the wound. The prohibition of the sale and use of explosives is the proper solution of the problem.

Wynter³ reports a case of **tetanus** occurring in a man 40 years of age, in whom the symptoms developed 10 days after a punctured wound of the foot, and which resulted in recovery under the combined treatment

¹ Med. News, April 18, 1903.

² Amer. Med., June 13, 1903.

³ Lancet, Nov. 15, 1902.

of antitetanic serum, bromids, chloral, physostigma, and morphin. The symptoms in this case became well marked, the patient suffering from frequent and severe convulsions, and the temperature reaching 102.6°. The morphin produced considerable rest, and the patient began to improve 10 days after the onset of symptoms. The patient developed an antitoxin rash. It is noticeable that there was an absence of prolonged spasm or fixation of the respiratory muscles or glottis. Sixty doses of antitoxin, of 10 cc. each, were given during the course of treatment.

F. L. Taylor¹ writes on **prophylactic injections of tetanus antitoxin in cases of wounds from toy pistols**. It is difficult to establish the value of these prophylactic injections because of the comparative rarity of tetanus, even among patients receiving dirty wounds. This fact does not, therefore, warrant the conclusion that prophylactic injections are absolutely prophylactic. Their use, however, in large numbers of cases will prove or disprove their efficacy. During the past 3 years Taylor employed this treatment in 72 cases of toy pistol wounds. In 57 other cases of the same injury the injection was not used. But one case in this series developed tetanus. The disease was fatal in this instance in which no prophylactic injection had been employed, but Taylor is not satisfied that the local treatment of the wound in this case was as thorough as it should have been. The statement is made that by the immediate and thorough cleansing and cauterization of the wound with carbolic acid and the prophylactic injection of antitoxin the Hudson Street Hospital has been rid of tetanus in cases of wounds from toy pistols. The action of the carbolic in these cases has been limited with alcohol. Some pains in the joints and rashes occur occasionally after the use of tetanus antitoxin, but these are transitory and usually cause but slight inconvenience. The dose employed was 10 cc. of the tetanus antitoxin.

Vallas² deals with the treatment of tetanus at considerable length, and concludes by stating that the **antitoxin treatment** stands far above any other. He also advocates the use of the remedy as a preventive agent. Chloral and carbolic may be used as auxiliary agents. Chloral is more useful because it is less dangerous. The local treatment of the wound is also of great importance. The greatest stress is laid on the prophylactic power of the tetanus antitoxin.

The **treatment of acute septicemia by the intravenous infusion of a solution of formaldehyd** has been brought before the profession by an article on the subject by C. C. Barrows.³ The author refers to the work done by Maguire, of London, in determining by experiments upon animals and upon himself the amount of formalin which may with safety be injected into the circulation. After numerous injections of the solution into his own arm he determined that the maximum strength of formaldehyd solution to be injected was 1:2000, which is equal to a solution of 1:800 formalin, and that the maximum quantity was 50 cc.

¹ N. Y. Med. Jour., June 27, 1903.

² Gaz. Hebdom. de Méd. et de Chir., Oct. 5, 1902.

³ N. Y. Med. Jour., Jan. 31, 1903.

for an adult. Reference is also made to the work of Ewing, of Cornell University, in injecting the formalin solution into the circulation of rabbits. The basis of Barrows' paper is a case of severe sepsis occurring in the Bellevue Hospital in a negro woman 26 years of age. The sepsis followed the delivery of a macerated, decomposed fetus at 6 months. Sepsis developed on the second day after her admission, when she had a chill. The examination of the blood showed an absence of malarial organisms and a leukocytosis of 18,000. Six days later a blood-culture was made which gave a pure culture of streptococcus. At this time the patient was first seen by Barrows, who found her with a temperature of 108°, pulse 150 to 160, and respiration 38. She was in a low muttering delirium. There were no local signs or symptoms. The patient was given 500 cc. of a 1:5000 aqueous solution of formalin. In 3 hours her temperature had fallen to 105°, and in 6 hours it had fallen to 101°, her pulse being 104 and her respiration 28. For 3 hours the temperature remained at 101°, when it gradually began to rise until it reached 103°, her pulse having risen to 120. It remained at 103° for 3 hours, when it plunged downward, until in 3 hours the thermometer registered by the rectum only 95°. The pulse had then fallen to 86 and the respiration to 22. In 12 hours the temperature had reached 102°, and the pulse 110. It then dropped to normal, but rapidly rose to 103°, although the pulse did not go higher than 112. Although a second blood-culture had been taken, there had not been time for a report, so it was decided to give her a second infusion, 750 cc. of the same solution being then given her. There was a slight chill without a further rise of temperature, which in the course of 12 hours fell to normal, where it has practically been since. The woman is up and about the ward, and from all appearances is entirely well. A number of blood-cultures were made since the first infusion, but none have shown any streptococci. Numerous microscopic examinations have also been made and no changes have been noted in the red corpuscles. Albumin, which was present in the urine before the infusion, disappeared and no blood occurred in the secretion. The author warns the profession against the indiscriminate use of this remedy when proper blood-cultures have not been made, and of course it must not be considered a substitute for the proper surgical measures which may be indicated in each individual case.

Wm. L. Baner¹ discusses Barrows' paper on the **intravenous injection of formaldehyd** and reports a case very similar to that of Barrows, in which the drug was employed without any good result. [Clinical experience with the use of formalin injections in cases of septicemia has been entirely too limited to render conclusions regarding its efficacy possible, and until the remedy has been used in a number of carefully watched and recorded cases it is hardly to be generally recommended.]

After detailing his experiments upon a number of animals to ascertain the value of **intravascular antiseptics**, Fortescue-Brickdale² writes the following conclusions: "Generally, then, it may be said that at present there is no experimental evidence which would warrant the assumption

¹ N. Y. Med. Jour., March 21, 1903.

² Lancet, Jan. 10, 1903.

that the course of a septicemia in animals can be influenced favorably by the intravenous injection of the antiseptic substances, and that the only result to be obtained by pressing such a treatment beyond the maximum nontoxic dose is to hasten the death of the animal. In view of the results described in this paper and those obtained by former investigators, it seems useless to continue trying to apply clinically a method which, while by no means free from special dangers and difficulties, is at present unsupported by any experimental evidence, either as to its present advantages or future prospects."

Julien and Tellier¹ discuss **septicemia of buccal or dental origin**, and base their remarks on 8 cases. The prognosis of this condition is always grave and most of the patients die. It is stated that the gravity of this condition in its early or chronic stages is frequently overlooked by both physicians and dentists. These patients require the most careful watching and treatment.

In the treatment of **traumatic gangrene of the extremities** a circular amputation of all structures, soft parts and bone together, just above the line of apparent demarcation is recommended by Knott.² Later, when the patient's condition is improved, a second operation, which consists in a higher division of the bone and approximation of the soft parts, is done. His reasons for advising this are that the cutting of the flaps and the introduction of the sutures tend to produce a gangrene of this structure, the circulation of which is already bad. He has practised the method advised 4 times,—once in the upper third of the thigh, once in the middle third of the forearm, and twice in the upper third of the leg,—with uniformly good results.

CYSTS AND TUMORS.

Henry Morris opened the discussion of the Surgical Section of the British Medical Association³ on the **treatment of inoperable cancer**. Under the term cancer he includes all malignant growths, and under the term inoperable he includes disease which cannot be entirely eradicated by any operative procedure, but does not imply by this term that the disease is of constitutional as distinct from local origin. The author discusses the various methods of treating inoperable cancer which have been brought forth in late years, deals with them most fairly, and reaches the following conclusions: "(1) That the bacterial treatment of malignant disease is not of the slightest use in carcinoma; that not one-half of the cases of spindle-celled sarcoma disappear under treatment with Coley's fluid; that in cases of sarcoma, other than the spindle-celled, Coley's fluid is not of value; that the treatment by Coley's fluid has many dangers, and should never be employed except in absolutely inoperable cases. (2) That Beatson's treatment is limited in its action to cases of mammary carcinoma, and the local and glandular recurrences after mammary carcinoma; and that even in these cases only a small pro-

¹ Lyon Méd., Feb. 15, 1903.

² Jour. Am. Med. Assoc., April 11 1903.

³ Brit. Med. Jour., Oct. 25, 1902.

portion are influenced by the treatment, while neither as a cure nor as a palliative can it be relied upon in any given case. (3) That rodent ulcer has in Finsen's light and in the x-rays its most successful treatment, so far as we at present know; and that this is true not only of cases otherwise inoperable, but also of operable cases, because of their excellent cosmetic results, and of their effect upon insidious and nonevident foci. There are, nevertheless, cases of rodent ulcer which resist the light, and others which resist the x-ray treatment, and some of these cases are successfully treated by excision and caustics. (4) That sarcoma, epithelioma, and the other forms of carcinoma are best treated, whenever possible, by early excision; and that all forms of treatment hitherto tried in inoperable cancers of these kinds are uncertain and inconstant in their effects, and unreliable as to the durability of the results they produce. In the vast majority of cases they are quite without palliative influence of any kind, except possibly in relieving pain. (5) That the boundary-line between what are considered operable and inoperable cases needs revision from time to time; that the tendency to extend the limits of operable cases needs in some instances to be restricted, and in others there may prove room for further extension. (6) That it is open to question whether some of the operations performed for relief or prolongation of life in inoperable cases of malignant disease should not be abandoned, and whether in other cases palliative operations ought not to be more often performed. (7) That investigations into both the cause and nature of cancer are of the first importance, as being more likely to ultimately lead to cure than any treatment at present known. (8) That, with few exceptions, the attempts to cure cancer by means other than early and free operations have been hitherto almost invariably futile." [Our experience with the x-rays indicates that superficial malignant growths are apt to disappear when so treated, but are very prone to recur, and that the x-rays should be used only when operation is contraindicated or refused. In surface carcinoma the x-rays usually retard growth and relieve pain. Deeply seated growths are practically uninfluenced. Dawbarn's operation of bilateral extirpation of the external carotids and their branches is very valuable when employed for inoperable malignant growths fed by these vessels.]

Beatson, in continuing the discussion opened by Morris, speaks particularly about the operation of **oophorectomy for inoperable cancer of the breast**. In many of the cases the effects of this procedure on the local manifestations are transient, and fresh nodules appear. Notwithstanding this, there has been in a large number of cases an improvement in the general health with the relief of pain. In a smaller number of cases the disease has disappeared and the patients have remained well for some years after the oophorectomy. In the present state of our knowledge of cancer this operation is not justified as a substitute for free and early removal by the knife, but Beatson maintains that there are inoperable cases of mammary cancer where it is of service in prolonging life and alleviating suffering. The author has never claimed for it any curative quality.

A. F. Meredith Powell¹ relates his experience in the **treatment of inoperable cancer with applications of formalin solution**, referring to a number of cases coming under his care. He states that when a solution of formalin from 1.5 % to 2 % is applied to the cancerous growth, the foul-smelling discharges cease within from 24 to 48 hours; that within from 3 to 7 days the cancer mass begins to detach itself and that healthy granulations spring up in its place. The process of separation is aided by snipping with scissors the fibrous bands which connect the growth with deeper structures. If weaker solutions than this are employed, the hardening process does not take place so promptly or so satisfactorily; and if stronger solutions are used, the application is painful. Absorbent lint is soaked in 2 % formalin solution and laid on the tumor. This is changed every 6 hours. After a few days the use of the formalin is painless and separation takes place as before described. [Sufficient time has not elapsed since the use of this treatment, nor has it been employed in a sufficient number of cases, to warrant its use in any other than in absolutely inoperable cases, and it is in these cases alone that Powell recommends it.]

J. Chalmers DaCosta² reports 2 cases of **carcinomatous change in an area of chronic ulceration, or Marjolin's ulcer**, and discusses the malignant changes taking place in superficial chronic ulceration. Both of the cases reported occurred in women, and represented epitheliomatous change developing in chronic varicose ulcers of the leg. In both cases amputation was declined and in each the diagnosis was verified by microscopic examination. DaCosta approves characterizing these conditions as Marjolin's ulcer, since this investigator carefully studied and accurately described the condition over 50 years ago. "A great many hold that in such cases as those reported the ulcer is not directly converted into a cancer, but that the chronic irritation in the ulcerated area simply allows of the admission and favors the destructive action of some cancer germ. It is certainly not proved, at the present time, that cancer is due to a germ, although many of the ablest students and observers are of the opinion that it is. There is no theory as to the cause that is really capable of explaining all the phenomena of cancer. Besides the fact that regions that are irritated or injured are particularly prone to develop cancer, the parasitic theory has gained support from the observation that metastases take place; and that it may be possible to inoculate the growth into the lower animals, or that an accidental inoculation may take place in man. When a cancer arises from an ulcer, it is not to be supposed that the connective tissue of the ulcer has been converted into epithelium. The proliferating epithelium of a cancer must spring from preexisting epithelium; hence, it sometimes comes from epithelial elements, such as sweat-glands or hair-follicles, that lie undestroyed among the granulations of the ulcer, or, what is more common, from the edges of the ulcer itself." The fact that malignant growth can follow chronic irritation is not proof positive that the irritation is its direct cause. DaCosta

¹ Brit. Med. Jour., May 30, 1903.

² Ann. of Surg., April, 1903.

does not accept readily the views of Gaylord and others who maintain that protozoa are the cause of cancer. The existence of metastases seems, at first glance, to be strongly suggestive of a parasitic influence. These secondary tumors are, however, not due to the proliferation of lymphatic structure in that region, as would be the case in an ordinary infection; but they are the result of the transfer of epithelial cells from the primary focus, the deposition of these cells in the lymphatic tissue, and their multiplication in this tissue. In view of the possibility that an ulcer of the cutaneous surface may become malignant, it becomes highly important that every chronic ulcer should be subjected to a thorough study for the purpose of making a careful diagnosis. As previously stated, in any chronic ulcer malignant change is most apt to appear at the edges, and persistent and increasing induration should excite suspicion. When a carcinomatous change takes place in a chronic ulcer, induration usually begins at a portion of the margin and spreads slowly, progressively, and inexorably; although, even after it has existed for a considerable time, we may find but one-third or one-half of the margin of the ulcer to be malignant, the balance of its edge being non-malignant. In fact, it is extremely rarely that the entire margin of a large ulcer is converted into malignant disease; it requires a long time to effect this. An important fact to remember is that, while very chronic simple ulcers are rarely tender or painful, in malignant disease there is both induration and pain. When cancerous changes take place in a chronic ulcer, the discharge is increased in amount, becomes ichorous, and bleeding may occur. At some time or other the anatomically related lymph-glands are bound to enlarge; although this seems, as a rule, to be late, probably because the previous induration has blocked up the lymph-channels. The most difficult case in which to make a diagnosis is one in which there has been great preexisting induration of a chronic ulcer, and the knobby induration of the cancerous change is not appreciated and differentiated for a considerable time. In every doubtful case of chronic ulcer, portions should be removed from the margins and be studied by a skilled pathologist. When the surgeon removes a bit of growth for microscopic investigation, it should be large enough to make many sections, and should include not only a portion of the obvious growth, but also a portion of the adjacent and apparently healthy tissue. Infiltration of the **apparently healthy** tissue with embryonic epithelium demonstrates the existence of carcinoma. Having clearly reached a diagnosis of cancer, amputation is the proper treatment, and the inguinal glands should be removed at the same time. x-Ray treatment has proved a cure for some of these cases, and should always be tried in case operation is refused.

In connection with the above report, the following case reported by Martinelli¹ is interesting, as it illustrates the **development of cancer on old cicatrix**. The patient was a man aged 45, who 20 years previously received an extensive laceration of the thigh, requiring several months to heal. Some months before coming under Martinelli's treat-

¹ Giorn. dell Assoc. Napol. di Med. e Nat., Sept. and Oct., 1903.

ment the patient received a large lacerated wound through the site of the old scar. The wound did not heal, in spite of treatment there remaining a large square-shaped ulcer. The upper half of the ulcer was concave and the lower markedly convex, with exuberant granulations which bled readily. The margins were infiltrated with numerous nodules and the inguinal glands were enlarged. A diagnosis of epithelioma was made and the leg amputated. The diagnosis was confirmed by microscopic examination. The glands of the groin were also removed at the time of the amputation. Twenty months after operation the patient was in excellent health, with no evidence of return of the disease. Martinelli discusses the literature of this subject and shows the frequency with which cancer develops in cicatrices and ulcers.

A note upon the **possible relationship between carcinoma and nerve or trophic areas** is presented by Cheatle.¹ It is maintained, first, that there is in some cases a marked relationship between the spread of the primary focus and the distribution of nervous and trophic areas. Deduced from this observation is the practical conclusion that the extent of these areas should be taken into consideration in marking out incisions when removal of cancer is contemplated. The author does not wish to detract from the importance now attaching to the lymphatic pathways of distribution, but desires to point out another factor. He also states that there is reason for thinking that the incidence of cancer within a nerve area is not a fortuitous circumstance, but that it may be due to direct or indirect nervous influence upon that area. In justification of these views Cheatle presents numerous illustrations of superficial malignant disease of the head and neck which show marked limitation to certain trophic areas. He does not claim to have enunciated a new theory of cancer, but does assert that there is reason to justify us in taking into consideration the possibility that the genesis and spread of cancer, even when considered apart, may be connected directly and indirectly with the nerve influences which persist over the areas affected.

Stanley Boyd and Unwin² present a personal series of cases of **cancer of the tongue** occurring during the past 12 years, and in 27 of these cases some part of the tongue other than the frenum was the primary seat of the disease; in 7 the frenum seemed to be first affected. As one of these cases was recurrent and could not be traced, it is not included in these statistics. The cases are divided into two classes, those in which the primary disease was situated in the tongue and those in which it was situated in the frenum. Of the 26 cases in which the tongue was involved, 1 patient is alive and well (11 years); 2 died—6 and 4½ years after operation free from obvious cancer; 2 are free from obvious cancer at the time of writing—one 8½ years after removal of a cancer on the right tongue and more than 2 years from a second operation for a cancer on the left side of the mouth; in the other 11 months only have elapsed since the operation; in 2 cases life seemed to be considerably and usefully prolonged,—4 and 5 years,—but one is dying of certain recurrence in glands low in the neck, and the other most probably had some intrathoracic

¹ Brit. Med. Jour., April 18, 1903.

² Practitioner, May, 1903.

and possibly hepatic recurrence. Five patients died; 4 soon after operation—1 apparently from septicemia, 1 from "exhaustion" (?), 1 from empyema, 1 from bronchopneumonia. The fifth patient died of bronchopneumonia from a foul mouth after a gland operation only. In the 14 remaining cases the disease recurred quickly; in only 1 of them did a year elapse between the first operation and recurrence. Under this heading of recurrences, ultimately proving fatal, must of course be placed the two cases already dealt with, making a total of 16 cases in which the disease recurred and was not successfully dealt with. Of the 7 frenal cases operated upon, 1 patient remained free for $3\frac{1}{2}$ years and then the disease recurred; 1 is at present sound, 2 years and 4 months from operation; 3 died; 2 had recurrences. A table of these cases is presented, giving a brief history of each case, and the fatal ones are considered at some length in the text. The authors believe, though they admit that it is difficult to prove it, that some recurrences have been due to direct inoculation of raw surfaces from the growth as it was dragged past them. But the great majority of recurrences are due, *in loco*, to the removal of an insufficiently wide margin of apparently healthy tissue round about the primary growth; or, in glands, to a too limited operation upon the gland-area in connection with that growth. A disease that is so difficult to arrest as this is, certainly justifies the freest excision. In operating the authors most commonly employed Langenbeck's section of the jaw in front of the ramus, with wide separation of the two parts. It has been their endeavor to remove the growth in a capsule of apparently healthy tissue which is nowhere less than half an inch in thickness, and which is double this, if possible, behind and beneath the growth. Section of the muscles above the hyoid bone is the most certain way of obtaining this. There is probably most danger of recurrence in these two directions. As the lymphatics from the anterior part of the tongue and floor of the mouth are said to pass through the mylohyoid muscle on their way to the submaxillary glands, a careful examination, at least, of this muscle should be made in cancer of these parts; and removal of it and the anterior belly of the digastric is advisable in advanced cases. Cases in which it may be justifiable to omit removing associated glands are very exceptional. The question of the extent to which these operations should be carried is still a matter of opinion. The cases recorded will show that the magnitude of the operation has been steadily extended. In early cases, whether in the anterior or middle third of the tongue, the submaxillary glands and all glands beneath the sternomastoid muscle, parotid gland, and posterior belly of the digastric muscle down to the bifurcation of the carotid artery and backward as far as can be reached along the eleventh nerve, should be removed, together with as much connective tissue as can be readily taken away with them. If the history shows that an epithelioma has existed for more than 2 months, especially in the middle and posterior thirds, it will be wise to add an incision along the anterior edge of the sternomastoid to the clavicle and to remove the deep cervical glands as far as can be done without dividing muscles. If the mid-line of the tongue or the floor of the mouth is crossed by a growth a gland-

operation should be done upon both sides. So should it in most, if not all, cases of cancer of the posterior third of the tongue. If a gland is adherent to a muscle or to a vein, a good portion of that structure should be removed with the gland. After describing the preliminary preparation of the patient, particular attention being paid to the teeth, the following is the technic practised by the authors: "The mouth is cleansed and the surface of the growth cauterized. The gland-operation is first carried out and the wound is closed, if it is certain that the tongue-wound will not open into it; if there is any doubt about this, it is left open. In either case it is 'guarded.' Then the growth in the mouth is removed. The head is generally turned toward the same side as the disease; but sometimes, especially when the jaw is sawed, toward the opposite side. In either case the dependent side of the nasopharynx and cheek are arranged so as to form a 'well' for blood below the level of the glottis; with this position it is rare to hear the slightest rattle. A head-light or hand search-light is used. Tracheotomy is performed only for dyspnea. If the jaw is to be divided anywhere, the lip and chin are always divided in the mid-line, and the cheek and Kocher's submaxillary flap are raised to the proper extent. The paralysis of the lower lip which resulted from Langenbeck's cut down from the angle of the mouth is thus avoided. After the removal of the growth, every endeavor is made to cover over the raw surface in the mouth with mucous membrane, and to leave a mobile tip to any tongue that remains. Extensive early healing may thus often be brought about, and discharge into the mouth is proportionately diminished. If the wounds in the mouth and neck communicate or even come close to one another, the latter is freely drained with a gauze plug. The mouth-wound is painted with Whitehead's varnish. Until the patient has recovered consciousness and any shock has passed off, he is kept lying on the sound side, with the angle of the mouth low, and is well looked after by a nurse. After a few hours he is set upright against a bed-rest, and remains in this position; fluids tend to run out of the mouth, the patient is more easily assisted to get rid of mucus; he breathes, spits, and coughs more effectively. His mouth is frequently cleaned with 'dabs' moistened with soda-solution. Twice a day mouth, teeth, and tongue are carefully gone over, and after one of these cleanings Whitehead's varnish is applied to the dried surface. The patient rinses his mouth frequently, and always before and after food. He is fed at first by the rectum, and, if necessary, by stomach-tube; these means of feeding are abandoned as he becomes able to swallow. Little or no stimulant is required." The advantage of a two-stage operation is not great, and when it is resorted to it is suggested that the gland-operation should be done first and that the lingual arteries should be ligated.

Jonathan Hutchinson, Jr.,¹ presents the following facts as showing the difficulties met with in diagnosing **epithelioma of the mouth from tertiary syphilitic and other lesions**: "(1) From at least 30 % of patients with epithelioma of the tongue a history of former syphilis can be obtained. (2) In perhaps 20 % epithelioma supervenes on tongues

¹ Practitioner, May, 1903.

that have been the site of chronic syphilitic inflammation; superficial glossitis may be actually present when epithelioma develops. Thus syphilis of the mouth predisposes to, and often passes directly into, cancer. (3) While in the majority of cases an accurate diagnosis can be made of any individual ulcer or lump on the tongue, lips, etc., in a certain number it is quite impossible to tell until microscopic examination of sections has been completed. (4) The 'therapeutic test' is often fallacious; that is to say, when iodids are given for epithelioma of the tongue it is quite common for the condition to appear to improve, especially as the hygiene of the mouth will probably be attended to at the same time and alcoholic stimulants left off. The patient may also lose his pain under iodids for some little time, just as he will under the x-rays. (5) Epithelial cancer of the mouth has no uniform characters, its origin and progress vary greatly. In 19 cases out of 20 it presents itself as 'a growth'; there is a raised hard edge to it, often a papillomatous projection. Yet now and then, so far from there being any growth, the affected tongue slowly and steadily shrinks, just as the breast does in atrophic cancer. The common forms of epithelial cancer of the tongue and lips are the hard-edged ulcer, the warty or papillomatous projection, the indurated plaque, and the bossy or nodular induration. In all the three last forms cancer may exist for some time, and infect lymphatic glands, before any ulceration occurs. The time-honored distinction, 'cancer of the tongue is an ulcer which indurates, while tertiary syphilis causes an induration which ulcerates,' is even less true than the majority of such axioms in surgery." The **site of the condition** is one of the best aids to diagnosis; gummatous ulcers being frequent on the palate, the back of the pharynx, and the dorsum of the tongue. On the free border of the lips, the sides of the tongue, and the floor of the mouth gummas are rare, and here cancers are frequent. If an ulcer exists, the induration and projection of its edges are greatest in cancer. Shooting pain, especially that referred to the ear, is a symptom which should excite the gravest apprehension in a case of doubtful ulcer of the tongue. The examination of the scraping from the floor of an ulcer (a test introduced by Mr. Butlin) is of undoubted value, but it should be carried out with great care. The floor of the ulcer must first be thoroughly cleansed of all extraneous matter or discharge; the scraping then made should be stained with methyl-violet or blue, placed in glycerin or distilled water, and examined under a microscope of medium power. The **age of the person** is not the slightest help in diagnosis. The author refers to a girl, 19 years of age, under his care for an epithelioma of the tongue. The age and sex of this case make it unique. Hutchinson regrets the frequent enumeration of the late symptoms of cancer, stating that when these develop the merest tyro can make a diagnosis, but it will be made too late for relief to be given to the patient. He states that far too much has been made in the textbooks of diagnosing epithelioma of the mouth by the presence of hard, swollen glands in the neck. "To expect these enlarged glands in every case of cancer of the mouth, when it first comes under care, is folly; to delay operative treatment until they can easily

be felt is a crime." The lymphatic glands draining a malignant area should always be removed, whether they can be felt or not. The time at which the first operation is done is the surgeon's opportunity; if he delays to deal with the glands until they are easily palpated, the patient's chance is practically gone. Attention is also called to the fact that septic, syphilitic, or tuberculous ulcers of the mouth frequently cause glandular enlargement in the neck; hence in the differential diagnosis of cancer reliance on this symptom must be entirely fallacious. Hutchinson states that leukoplakia linguæ will practically in all instances develop into epithelioma. Whenever the opportunity presents of excising part of the tongue for epithelioma supervening on leukoplakia, the white patches should be freely removed with scissors at the same time as the part affected with the cancer. "A chronic hard-edged ulcer of the tongue opposite a sharp or carious tooth must always be regarded with suspicion. If the removal of the exciting cause be not followed by healing of the ulcer, it is usually best to treat the latter as a commencing epithelioma and to excise it freely. Here, as in the case of persistent hard ulcers of the lips, the microscope may fail to confirm the diagnosis of cancer, but the patient is rid of a grave risk at the expense of a small operation. Mistakes in diagnosis are far more frequent in the direction of overlooking cancer of the mouth than in urging operation for an innocent lesion. The microscope, moreover, is not infallible, and the earliest or 'pre-cancerous' stage can hardly be certified by its aid. It is by prompt excision of suspicious ulcers or papillomatous growths, whether of the tongue or lips, that a hope is held out of diminishing the terrible mortality from true cancer of these regions."

Excision of the tongue for cancer is discussed by Walter Whitehead.¹ The author calls attention to the fact that in order to arrive at a correct conclusion as to the direct risks resulting from operation for cancer of the tongue, those cases in which the tongue alone is involved should be separated in our tables from those in which the adjacent structures are also the seat of disease. Whitehead has excised the tongue with scissors for disease limited to this organ 116 times with but 3 deaths. One of these patients died from rupture of an abscess of the lung on the second day; a second died on the twelfth day from syncope; and the third, a man of 70, died on the fourteenth day, from exhaustion. In these cases the whole tongue was removed with the scissors without any external incision, preliminary ligation of the arteries, or a previous tracheotomy. Operation for malignancy cannot be performed too early, and the associated glandular area of the tongue ought to be explored either at the time of operation or subsequently, independently of there being any evidence of glandular enlargement. Whitehead does not approve of division of the jaw, the use of the *écraseur*, preliminary tracheotomy, or preliminary ligation of the lingual arteries. Regarding the tracheotomy, he maintains that a greater mortality follows this operation than need result from excision of the tongue. As an operating-table Whitehead prefers to use an ordinary rocking-chair, and describes a

¹ Practitioner, May, 1903.

method of supporting the patient in it by means of a figure-of-eight bandage about the chest. The entire operation as described by Whitehead is performed with scissors. The technic of the operation is as follows: "(1) When the patient is narcotized, gag the mouth on the opposite side to the one intended to be operated upon; but if it is contemplated to remove the whole tongue, use two gags—one on each side. (2) Seize the tip of the tongue with a pair of forceps; pull it forward, and when it is in this position, pass through it a strong ligature for the purpose of forward and upward traction during the operation. This is a most important matter, as the traction not only controls to a large extent the main arteries, but it makes all the subsequent stages of the operation much easier. (3) With this ligature in his left hand, the operator draws the tongue forward and upward to the fullest extent, and commences the excision by freely dividing the frenum by means of a pair of scissors. The lower blade of the scissors is slipped under the mucous membrane on one side of the tongue and run along this side as far back as the anterior pillar of the fauces. By closing the scissors the attachment of the mucous membrane to the jaw is severed. After dividing the anterior pillar of the fauces he finally liberates the lateral attachments. As a rule, after dividing the frenum, a finger can be easily run under the mucous membrane, and be made to act as a guide for the scissors. The same proceeding is of course repeated on the other side, when the whole tongue is going to be excised. If these incisions be completely accomplished, it will be found that nearly the whole of the tongue can be pulled out of the mouth, making the remainder of the operation almost extra-oral—at any rate, so much so that there need be little fear of any blood getting into the air-passages. Now the more critical part of the operation commences—the one most dreaded by the inexperienced. Having proceeded so far in separating the tongue with scissors, the timid surgeon need make no further use of a cutting instrument, if he wishes to avoid any risk of unintentionally dividing the arteries. The tissues can be ruthlessly broken down and torn asunder. With a dry dissector he can break down the remainder of the friable tongue, and expose the arteries and the nerves as cleanly as if he were making a dissection. Nothing is then easier than seizing each artery separately by forceps, snipping the distal end, and gently twisting the stump of the vessel. The greatest confidence may be established by the almost universal certainty that if, after the forceps are removed, no immediate bleeding of that artery takes place, no subsequent hemorrhage need be feared. This, in my opinion, is an unanswerable argument in favor of torsion as against the use of the ligature, which some surgeons use in preference. Having twisted each artery, it is desirable, in my opinion, before proceeding further to place a loop of a strong ligature through the under and attached part or stump of the tongue, to prevent the stump falling back when the tongue is finally removed. That this is an advantage is denied by Sir Frederick Treves; but I still maintain that a ligature should be passed through the glossoepiglottidean fold for the purpose of traction after the tongue has been excised, should secondary hemorrhage occur—a very remote

contingency. In private practice it certainly affords the attendant nurse an element of confidence. In hospital practice the precaution is perhaps unnecessary. The final separation can be completed by either snipping through the remaining muscular fibers, or deliberately twisting the stump until the tongue becomes completely detached." After the tongue is removed the floor of the mouth and base of the tongue are covered with a special varnish. As an ordinary routine, it is desirable to prop the patient up in bed and prevent his reclining during the night. The next day he should be encouraged to get out of bed and sit up; and on the second day, if the weather is congenial, there is no disadvantage in allowing the patient to go out-of-doors. In closing, Whitehead refers to a number of patients operated upon for cancer of the tongue and well after many years. In one case 13 years have elapsed and in another 11.

Butlin,¹ in a clinical lecture, discusses **unsuccessful operations for cancer of the tongue and the early diagnosis of this disease**. Eliminating all cases that were in the slightest degree questionable, 28 absolute successes are reported out of 113 operations. Twelve cases died from some other disease than cancer of the tongue within 3 years and 14 died of the operation. Twenty-nine patients died of recurrence in the mouth. The disease recurred in most of them very quickly, and all of the patients went through the same stage of suffering before death through which they would have passed had no operation been performed. Therefore these cases must be regarded as absolutely unsuccessful. Forty-one patients died from secondary growths in the lymphatics without recurrence in the mouth. The results here presented when looked at alone are discouraging, but when compared with previous statistics they are encouraging. The author points out very clearly that early diagnosis of cancer of the tongue is easy, and lays great stress upon the fact that the greatest care should be given to those conditions which may be looked upon as predisposing causes to cancer of the tongue, since about 90 % of the cases have been the subject of one of these predisposing conditions. Any chronic superficial inflammation of the tongue, especially if accompanied by cracks and fissures, or chronic ulcers, predisposes to cancer. Other conditions are spoken of as pre-cancerous; that is, those which may be looked upon as certainly to be followed by cancer itself. Among these are warty growths; flat ulcer due to irritation which does not heal after the cause of the irritation is removed; and leukoplakia. Excellent illustrations of each of these conditions accompany Butlin's article. The author states that old chronic ulcerations of the tongue are not nearly so dangerous as the white thick plaques, or as the indolent ulcer, which makes steady progress in the course of a few weeks or months. In order to illustrate the effect upon speech of the removal of the tongue, Butlin refers to a number of patients upon whom he has operated and who speak with practically no difficulty. The author closes his lecture with the advice that all warts or warty growths should be removed as soon as discovered, and that indolent ulcers upon the surface or under-border of the tongue which are ascribed to the rubbing of the teeth should be treated first by the

¹ Brit. Med. Jour., Feb. 14, 1903.

removal of the cause of the irritation, and later, if persistent, by excision. The operation is trivial and may save the patient from great misery. If white patches or plaques become thicker or if they become a little more prominent, and particularly if they show a tendency to break down in the center or soften, let them be removed with as little delay as possible. Of late years it has been the author's practice to go further than this and advise patients suffering from bad superficial glossitis, where the tongue is constantly irritated and where the patient consequently is always suffering and always in dread and danger of cancer, to have that portion of the tongue removed, even when there is no sign of cancer or of a precancerous condition. [A recent case impressed us with the necessity of clearing out the lymphatic glands from both sides of the neck. The left half of the tongue was removed for cancer of the left edge of that structure, and the lymphatics were removed from the left side of the neck. Eight months later the tongue was sound, there was no growth in the left side of the neck, but the right side of the neck presented irremovable lymphatic involvement.]

Sir Thornley Stoker¹ presents an interesting discussion on **cancer of the lips**. It is the author's belief that heredity plays little part in the etiology of cancer. "Like epitheliomas in other superficial situations, cancer of the lips, when it occurs at or after middle age, is often preceded and accompanied by a general papillomatous condition of the skin, or by the allied state in which there is a hyperplasia of the cuticle in scaly masses. This condition is distributed over various regions of the surface, and is usually best marked on the face, neck, and front of the chest. It is so frequent that it should be regarded as a warning of graver trouble to come, and as confirmation of the diagnosis of an otherwise doubtful case of epithelioma. It bears the same relation to epithelioma of the skin that leukoplakia does to cancer of the tongue. Warts on the lip, if they have been irritated by treatment, or subjected to much handling or other irritation, often undergo a change to the heteroplastic condition and become malignant." The use of the clay pipe is the exciting cause of lip cancer in almost every case. The disease is rarely found in non-smokers. In all cases of cancer of the lip which Stoker has met with in women the patients were addicted to the use of the pipe. It is stated that it is doubtful whether syphilis is an important predisposing cause of cancer of the lip. Out of 350 cases operated upon by Stoker, only 3 of the patients were women, these 3 being Irish peasants who smoked assiduously. The author has only seen the upper lip involved in 4 cases. "The **progress** of a lip cancer, when not checked, is tolerably definite in its direction. It proceeds to infect the lymphatic glands below the jaw, and, later on, down the neck. The submaxillary salivary glands do not become affected until extensive infection of the lymph-glands has taken place. Next the lower jaw becomes involved, and, lastly, the floor of the mouth." Secondary cancer, in the shape of deposits in remote organs, may be looked upon as practically unknown. The patient dies before it can occur. Death usually results from

¹ Practitioner, May, 1903.

PLATE 1.



1
Neurofibromatosis of the nerves of the tongue (macroglossia neurofibromatosa) and of certain other nerves of the head and neck : 1, Side view of child, with tongue as habitually protruded ; 2, dissection of parts removed from the neck (Abbott and Shattuck, in Ann. of Surg., March, 1903).

exhaustion, septic disease of the lungs, or hemorrhage. It is gratifying to observe that the use of caustics and pastes of all kinds for cancer of the lip has practically been abandoned. When the disease is limited, operation is both simple and successful, and is rarely followed by recurrence. "But when the lower jaw has become diseased, a condition always accompanied by more or less extensive cancer of the chin, and perhaps of the lower part of the cheeks, operation assumes a different aspect, and should rarely be undertaken." Removal of the submaxillary glands is suggested in all cases. [No matter how early operation is performed the submaxillary lymph-glands should be removed. In a case of 10 weeks' duration the microscope showed involvement. The submaxillary gland of the diseased side must also be taken away. As a rule, carcinoma begins at the mucocutaneous junction of the lower lip. If it begins distinctly on the mucous surface, it is more malignant.]

Abbott and Shattock, of St. Thomas's Hospital, London,¹ report an interesting and rare case of **neurofibromatosis of the nerves of the tongue (macroglossia neurofibromatosa) and of certain other nerves of the head and neck**. Clinically the disease would be classified under the head of macroglossia, but it has nothing in common with the ordinary lymphangiomatous or hemangiomatous forms of the disease; therefore, the author suggests the name of macroglossia neurofibromatosa. Although in this case there were other nerves than those of the tongue involved in the disease, the tongue was the most prominent feature and renders the case unique. The patient was a female child, 4 years of age; except the present ailment the child was perfectly well mentally and physically. The accompanying illustration (Plate 1, Fig. 1) represents very well the condition at the time of admission to the hospital. The enlargement of the left ear was noticed at birth, but that of the tongue was not observed until the child was 2 months of age. The tongue steadily increased in size, and when the child was 1½ years old began to protrude from the mouth, which was more or less constantly kept open. There has also been a gradual increase in the size of the left side of the face, and a constantly increasing tumor of the submaxillary region. At the time of admission the tongue was kept protruded from the mouth during all the day and nearly always when the child was asleep; it could, however, be withdrawn into the mouth. The involvement of the tongue was found to be entirely confined to the left side. The tumors of the submaxillary region and ear are well shown in the accompanying cut (Plate 1, Fig. 2). The right side of the face and neck was absolutely normal. The child spoke with some difficulty, but could be easily understood; when she cried or got into a temper, there was a definite bright flush over the whole left side of the face. This had been present from infancy and was not accompanied by unilateral sweating. In September, 1900, Abbott removed nearly the entire left side of the tongue, and about 3 weeks later the tumor from the submaxillary region. The latter "consisted of worm-like coils of semitransparent white cords, inextricably twisted, and with knots in

¹ Ann. of Surg., March, 1903.

places. These cords varied much in size, from extremely small and thread-like ones to others the size of a No. 3 catheter." There was little bleeding from the tongue, but the mass in the neck was separated from surrounding structures with difficulty. The child made a good recovery except for facial palsy due to the involvement and consequent injury of the left facial nerve. Examination of the child on May 6, 1902, showed that the facial palsy had greatly improved, that she was able to use the tongue freely, and that it lay entirely within the mouth, which was naturally kept shut at this time. There was a recurrence in the tongue about the size of a small almond. The general appearance of the face was much improved. Mr. Shattock's report upon the portion of the tongue removed shows "in a highly pronounced degree the condition of fibromatosis of the nerves or plexiform neurofibroma. Every nerve, as shown by dissection, is enlarged from the disease, even to those terminating in the divided mucosa along the lower side of the organ. The nerve most enlarged, the trunk of the lingual, measures 0.5 centimeter in diameter. All the nerves are remarkably increased in length as well as in thickness so as to lie in serpentine or short transverse folds, with the result that in many situations a compact plexus has been produced. Toward the middle line of the organ such a plexus quite exceeds the distal portion of the enlarged trunk already referred to." In removing the mass from the neck it was found necessary also to remove the submaxillary salivary and lymphatic glands, and the nerves supplying these were found involved. The following nerves were found involved in the tumors: "Among motor nerves, the hypoglossal, facial, and motor branch of the third division of the fifth nerve. Among sensory nerves, the glossopharyngeal, the lingual and auriculotemporal branches of the third division of the fifth nerve, and the transverse cervical, suprasternal, and supraclavicular descending branches of the cervical plexus." The only suggestion the authors have to make regarding the unilateral flushing is that it was possibly due to some involvement of the cervical sympathetic.

A case of **generalized unilateral neurofibromatosis** (von Recklinghausen's disease) under the care of Mr. Heaton is reported by Nuthall and Billington.¹ The patient was a man 38 years of age who was admitted to the hospital because of severe neuralgic pain in the right jaw and of difficulty in swallowing. The right cheek was greatly swollen. The patient stated that when 3 years of age he fell and cut his right cheek, and that 2 years later a lump developed which slowly increased and was removed when he was 11 years of age. Increase, however, continued progressively after the operation. A second operation was performed when the patient was 23 years of age and a number of superficial fibrous masses were removed from the right cheek. On admission all of the soft parts of the right side of the face below the eye were greatly thickened by what appeared to be a chronic hypertrophy or lymphatic edema. Scattered over the chest, abdomen and back, thighs and arms, were many swellings varying in size. The small nodules were cutaneous

¹ Lancet, Dec. 27, 1902.

and the large ones were subcutaneous. These tumors were for the most part painless and did not appear to interfere with the functions of the nerves on which they occurred, except in the case of a large tumor on the left musculospiral nerve near the elbow. Considerable relief followed neurotomy of the lingual and inferior dental nerves, and the mass situated on the musculospiral was removed. An attempt to remove a tumor within the mouth and which necessitated the ligation of the common carotid artery resulted in death a few hours after the operation. At the necropsy a tumor near the lower extremity of the spinal cord was also found. This report is numerously illustrated with drawings of various neurofibromas from different parts of the body.

The accompanying illustrations (Figs. 8, 9, and 10) represent a case of **probable myxofibroma of the nose**, which is briefly reported by Seabury W. Allen,¹ who, however, had very little opportunity to carefully study the case. The patient was 34 years of age and of unusual intelligence. The condition began 22 years previous. Allen employed 7 x-ray exposures, which greatly diminished the odor and the amount of discharge. Because of fear of hemorrhage the patient and his family would not permit a section of the growth to be taken for examination.



Fig. 8.—Allen's case of probable myxofibroma of the nose. Taken slightly from the right side; neither eye would have shown in a full-face view (Boston M. and S. Jour., Nov. 13, 1902).

John A. Wyeth² reports good results from the injection of **water at a high temperature into vascular tumors**. The author is careful not to claim that this treatment will cure every case or to say that it is absolutely without danger. Results have, however, warranted him in recommending its employment in the treatment of all subcutaneous vascular tumors. Before employing it in the human being Wyeth discovered that the injection of boiling water into the iliac artery of dogs resulted in the immediate occlusion of the vessel and all its branches. He has employed it in the case of a young woman suffering from a large angioma involving the chin, neck, and a portion of the submucous tissues of the mouth. Previous to this treatment Hunter McGuire and Wyeth had each at-

¹ Boston M. and S. Jour., Nov. 13, 1902.

² Jour. Am. Med. Assoc., June 27, 1903.

tempted operation, but had been obliged to desist because of hemorrhage. The patient was etherized, peripheral



Fig. 9.—Allen's case of probable myxofibroma of the nose. Upper arrow points to slough, lower arrow to mouth. Left eye has lost its sight (Boston M. and S. Jour., Nov. 13, 1902).

compression was applied, and about one-third of the tumor was injected with from 2 to 3 ounces of boiling water. Notwithstanding the great heat there was no necrosis of the mucous membrane. The operation lasted about 10 minutes, and after it the patient suffered no pain and there was no elevation of temperature. Within 2 weeks after the first injection the area injected diminished, becoming less than half its former size. Altogether, 3 injections were made, resulting in the entire obliteration of the tumor. Two other cases are also reported in which the results were equally satisfactory; one of these was a very extensive cirroid aneurysm covering about one-half of the left side of the scalp, measuring about 5 by 6 inches, and being elevated above the normal scalp by a half-inch or an inch. Numerous ineffectual attempts had been made to arrest the growth of this tumor when it was small. The tumor was supplied by 5 arteries which could be distinctly located. In this second case the needle was introduced along the course of the arteries supplying the tumor and a quantity of boiling water sufficient to coagulate its vessels was injected. Following the operation edema of the face and neck developed. In another case



Fig. 10.—Allen's case of probable myxofibroma of the nose. Arrow shows discharging mucus (Boston M. and S. Jour., Nov. 13, 1902).

of this kind Wyeth stated that he would not attempt obliteration of the whole tumor at one operation, although the author has successfully employed that method in a number of cases of capillary angioma. He stated that on account of their superficial character some sloughing is apt to result unless the greatest care is taken. The weakened tissues in these cases do not offer the resistance of the normal skin which overlies the venous and arterial angiomas, and may break down under the hot water. Care should be taken in these cases to inject the water beneath the tumor and not directly into it. Wyeth states that he should not hesitate to employ this method in certain fistulas and ranula. He does not think the method applicable in the treatment of uterine fibromas. Dr. William J. Mayo, in discussing this paper of Wyeth's, referred to a case of very large venous angioma of the cheek which he had treated successfully with the injection of boiling water.

Fred. Griffith¹ presents a brief history of a case of **nevus of the scalp and nose** treated by hot water injections, as suggested by Wyeth. The patient was an infant girl 7 months of age. In the case of the scalp a number of injections varying from 10 drops to 1 fluid dram were employed. But 3 injections, however, were required in the case of the nose. The results obtained were very satisfactory.

In a clinical lecture J. Chalmers DaCosta² describes a case of **endothelioma of the mammary gland** on which he operated. The patient was a woman 31 years of age who presented no history of injury, abscess, or inflammation of the breast. The tumor had only been known to exist for 3 months, during which time it had made rapid progress. The patient complained of a dull, aching pain. The tumor was irregular in outline, being indistinct at the margins, and its center was hard and nodular. It appeared to lie directly beneath the skin and the aureola. Before removing the growth it was incised, and its vascular character led DaCosta to believe that he was dealing with a sarcoma. A microscopic examination of the growth, however, showed it to be a hemangioendothelioma.

Three cases of **inoperable cancer of the breast treated by oophorectomy** are briefly reported by Power.³ In 2 instances the patients had passed the menopause, and in these the operation was attended with no benefit. In the third case, however, in which the menopause had not been passed, the operation was followed by an arrest and apparently a retrocession of the cancerous process.

Taylor and Waterman⁴ report an interesting case of **subdural cervical carcinoma secondary to carcinoma of the breast**. The development of symptoms began about 2 years before the patient's death, when there were observed both sensory and motor disturbances in the left arm, which in the course of 21 months progressed to a practically complete motor paralysis. This was followed by similar disturbances in the left leg, and finally involvement of the right arm and leg. The beginning of these cord symptoms antedated the discovery of the breast tumor by

¹ N. Y. Med. Jour., May 2, 1903.

² Lancet, Oct. 4, 1902.

³ Amer. Med., June 27, 1903.

⁴ Boston M. and S. Jour., Feb. 12, 1903.

1 year, though it was not thought that they existed prior to the growth in the breast. The severity of the cord symptoms, and particularly the final paralysis of the leg, with involvement of the sphincters, were out of proportion to the lesions discovered in and about the cord. The points of interest in this case are: "A growth of long standing in the immediate neighborhood, but with slight involvement of the cord; limitation of the new growth essentially to the subdural space; extensive motor and sensory paralyses from involvement of nerve-roots alone; absence of pain attributable to invasion of sensory roots."

W. B. Bell¹ reports a case of **carcinoma of the male breast occurring in a man 56 years of age**. A small lump the size of a pea had been noticed behind the nipple $4\frac{1}{2}$ years previous to the date on which the patient came under Bell's care. The growth was removed, but recurred about a year later in the upper portion of the pectoralis major which had been left. The patient died 1 year and 9 months after the removal of the primary growth, with deposits in the liver and elsewhere.

Two cases of **carcinoma of the male breast** are reported by Frank C. Hammond.² The first patient was a man 75 years of age. The growth in this case was successfully removed, but the patient died about 2 years later from apoplexy. The second case was that of a man 50 years of age. The growth in this case was also excised.

Another case of **cancer of the male breast** is reported by Ballock.³ The patient in this instance was a colored man 66 years of age. The duration of the disease was given as 3 years. When the enlargement was first noticed there was a discharge of milky fluid from the breast, which did not last long. There was never any bleeding and no history of injury. The growth was thoroughly removed, together with the glands and adjacent tissue.

A case of **congenital periosteal sarcoma in an infant** is reported by H. J. Curtis.⁴ The growth involved the acromion process of the left scapula. The patient was a male infant $5\frac{1}{4}$ months old. The growth at birth was the size of a small hen's egg, and there was no history of injury, the child having been born without the aid of instruments. At the time of the operation the growth was the size of a large orange, extending from below and in front of the left clavicle to just above the lobule of the left ear. It was movable, except at the outer end of the clavicle, to which it was apparently attached. There were a number of nodules varying in size, some of which fluctuated. The skin over the tumor contained a number of large veins, and there was a small but distinct nevus over the prominent part of the swelling. The child was anesthetized and the growth easily removed, together with 3 small glands which were above the tumor. There was comparatively little hemorrhage during the operation, but later the child was very much shocked and required vigorous stimulation. The wound healed promptly. About 3 weeks after the operation the child developed fever and presented an enlarged gland in each groin. Within 2 weeks, however, these glands

¹ Brit. Med. Jour., Feb. 14, 1903

² Amer. Med., April 1, 1903.

³ Amer. Med., Nov. 22, 1902.

⁴ Lancet, April 11, 1903.

had returned to the normal size, and the child was apparently well. The growth proved to be typical mixed small-celled, spindle-celled, and round-celled sarcoma. There was evidence of the growth in the enlarged glands, which were removed. It sprang from the periosteum covering the acromion process.

Wagner¹ reports a case of **probable secondary sarcomatous growths in the femur following primary sarcoma of the thyroid gland**. The patient was a woman 48 years of age. She had had a goiter since she was a child, but it had given her little trouble until recently. Six weeks before coming under Wagner's care the patient began to suffer from pain in the left hip and thigh. The leg was held in a position of slight flexion, adduction, and internal rotation. The inguinal glands were enlarged but not tender; active movements produced pain, but passive movements produced none. There was a small resistant mass felt just above Poupart's ligament. The whole thigh was tender to pressure, especially the lower portion. The goiter was about the size of a large fist, firm and symmetric. It increased in size, the patient's general condition became worse, and she died 2 months after admission. The thyroid gland at necropsy was found to contain a spindle-celled sarcoma with a large number of giant cells. The neck of the femur broke during its removal, and on division it showed a tumor penetrating into the substance of the bone and 3 small masses in the medullary portion. These growths all presented the same appearances as that of the thyroid. The fact that there were no other secondary growths in the thyroid, and the frequency with which primary growths in this gland produced secondary growths in bones, and other points in the history, point in all likelihood to the thyroid tumor as primary and those in the femur as secondary.

An interesting case of **lipoma of the cecum** is reported by John O'Connor.² The patient was a woman 45 years of age who presented symptoms suggesting pyloric obstruction. A sensitive mass could be felt one inch below and to the right of the umbilicus. When the abdomen was opened, the mass which had been felt proved to be a distended cecum which was freely movable. The cecum was opened and a large fatty tumor embedded between the mucous and muscular coats was discovered. The mucous membrane covering it was gangrenous. The tumor was removed, the intestine was irrigated, and the bowel closed. The patient made a satisfactory recovery.

Leonard³ states that there is no method so potent in relieving **inoperable cancer** or in the treatment of **recurrent cancer as the x-rays**. It has been shown that this agent has an alterative and destructive action upon malignant tissue, producing retrograde changes that vary in their degree and intensity. These degenerative and destructive effects may be so great that in large subcutaneous malignant growths of low vitality such a rapid destruction may take place as to flood the system with toxins and result in a fatal autointoxication or septicemia. The harmful effect which has been noted as a stimulation of the growth of the tumor is prob-

¹ Münch. med. Woch., Sept. 2, 1902.

² Lancet, June 27, 1903.

³ Phila. Med. Jour., Feb. 14, 1903.

ably due to this cause or to a real stimulation by too weak a dosage. When the dosage shall be determined for the various manifestations of malignant disease, this agent will undoubtedly prove to be one of the most potent. Until then it must follow operative intervention as a supplement to that method, operation removing the macroscopic malignant tumor, the subsequent Röntgen treatment dealing with the microscopic residual disease that has escaped the knife. Such a combination is both curative and prophylactic. It destroys any foci that remain and prevents recurrence. It gives the patient the benefit of the two most potent methods of combating malignant disease. As a primary method of treatment it has no place, except when operation is contraindicated or when more cosmetic results can be produced, in cases in which life is not threatened by delay, or in which the disease is already inoperable. This agent must be employed with as great care as any other possessing such marked alterative properties. The harmful effects must be noted and guarded against by adapting the dosage to the individual patient and watching with care the systemic effects. Stimulation of the disease is the result of too weak a dose, autointoxication by the rapid destruction of large areas is the result of too large a dose.

William B. Coley¹ discusses the **present status of the x-ray treatment of malignant tumors**, setting forth the subject carefully and reporting briefly a number of cases. His conclusions are as follows: "We find abundant evidence that the x-rays have an inhibitory action on all forms of malignant tumors. Yet the number of cases is insufficient to enable us to state what particular varieties are most susceptible to this influence. So far it would seem that sarcomas primary in the lymph-glands yield most readily to the treatment. Superficial epitheliomas might be placed in the same category. Several cases of recurrent carcinoma of the breast have been observed in which the growths have entirely disappeared after prolonged exposures of the x-rays. Yet all these cases have been too recent to be classed as cured. In fact, sufficient time has not yet elapsed in a single case of cancer treated with the x-ray to justify us in regarding it as cured. While this should, on the one hand, prevent us from reporting patients as cured in whom the tumors have merely disappeared under treatment, it should not, on the other hand, lead us to minimize the importance of these immediate results, even be they no more than a prolongation of life or an alleviation of suffering. One cannot witness the marvelous melting away or disappearance of an undoubtedly malignant tumor under a few weeks' or months' treatment with the x-rays, without feeling that we have a new and powerful addition to our hitherto scanty means of attacking this disease. The knowledge of this new agent is so slight that there is added hope in our very ignorance. For by deeper insight into its nature, gained by further experience, we may hope to better utilize its power, and thus accomplish greater results."

T. A. Groover² discusses briefly the **treatment of cancer with the x-rays**, reports a number of cases, and reaches the following conclusions: "The x-ray is a form of energy capable of producing a profound influence

¹ Med. Rec., March 21, 1903.

² Virginia Med. Semi-Monthly, March 13, 1903.

on cell activity. The changes induced are trophic in character. The x-ray has a marked beneficial effect upon malignant growths, in some cases apparently effecting a cure. In the slow-growing epitheliomas, situated in accessible regions, the x-ray treatment should have precedence over all others. In advanced cases of malignant diseases, the x-ray is the best palliative measure at our command. From the nature of the problems which confront us a number of years must necessarily elapse before the status of the x-ray in the treatment of cancer can be accurately determined."

Grubbe¹ also deals with the **x-ray treatment of cancer and other malignant diseases** and reaches the following conclusions: "(1) The x-ray is the most remarkable therapeutic agent of the last decade. (2) In properly selected cases of so-called 'incurable conditions' the x-ray has brought about remarkable results. (3) Relief from pain is one of the most prominent features of the treatment. (4) Retrogressive changes are noticed in all primary cancer or tuberculous growths. (5) The x-ray has a pronounced effect upon internal cancers. (6) The greatest value of the x-ray is obtained in treating post-operative cases to prevent recurrences. (7) The proportion of clinical cures by this treatment is greater than that obtainable by any other method of treatment. (8) We are positively justified in assuming an idiosyncrasy to x-rays. (9) The peculiarities of each case must be studied in order to get the best results, i. e., no strict rules for treatment can be laid down. (10) Dermatitis, if properly produced, is within certain limits a desirable feature of x-ray treatment. (11) Since the vacuum of an ordinary x-ray tube changes constantly, such tubes are useless for radiotherapeutic work, and only tubes which allow of perfect control of vacuum should be used. (12) The x-ray has a selective influence upon cells of the body; abnormal cells being affected more readily than the normal. (13) Hemorrhages and discharges are decidedly lessened and, ultimately, cease in the majority of cases. (14) Even in the hopeless, inoperable cases, the x-ray prolongs life, makes the patient comfortable, and the last hours free from pain."

Rodman and Pfahler² deal with the present status of the **treatment of superficial carcinoma and tuberculosis by means of the x-ray**, and arrive at the following conclusions: "(1) The length of time required for the cure of epitheliomas is longer than by surgical or caustic treatment, while the cosmetic results are better. The dangers are proportionate to the urgency of the treatment, as indicated by the degree of malignancy. It should only be recommended in cases that are inoperable either because of the extent of the growth or its location. (2) It is absolutely the best means at our command for the treatment of superficial tuberculosis, and it gives better cosmetic results. (3) It should follow all operations for malignant disease or tuberculosis, with the twofold object of stimulating the healing process and of preventing a recurrence. In some cases it may be of advantage to give a course of treatment before operation, to destroy the outlying portions of the growth and make such operation of a less formidable nature."

¹ Med. Rec., Nov. 1, 1902

² Phila. Med. Jour., June 13, 1903.

ANESTHETICS.

The **management and preparation of the patient for general anesthesia** is interestingly and instructively dealt with by W. J. McCardie.¹ This address will prove particularly useful to those unfamiliar with the administration of anesthetics. Much stress is laid upon the moral as well as the physical condition of the patient, and especially on the psychic factor of fear, to which sufficient importance, it is asserted, has not been attached. Reference is made to a number of cases in which patients have died from simple fright just before the administration of an anesthetic. It is shown that fear may not only result fatally before the actual administration begins, but that it is sometimes productive of fatal shock in the early stage of anesthesia, especially when chloroform is used. The chief element of danger in cases in which fear is a factor is profound disturbance of the circulation, which may commence some days before the operation, and may persist till the patient is well under the influence of the anesthetic. In the worst cases Ballard has shown that there are signs of serious embarrassment of the right side of the heart, and in 2 cases he has observed an undoubted temporary tricuspid regurgitation, quite physiologic, no doubt, but none the less dangerous, for when the patient is still conscious, is struggling and holding his breath, the greatest strain is laid upon the heart, and sudden syncope is most feared. In such a case McCardie would hesitate to give chloroform. A heart free from murmurs may develop them when the patient is greatly excited by fear, just as it may after marked exertion. One repeatedly observes the increased roughness of a hemic murmur after the administration of an anesthetic. Pure fear without exertion seems to have the same effect as severe physical work on the heart, as Ballard points out; that is, it tends to dilate its cavities, especially the right cavities, to weaken the cardiac muscles, and produce a quick and feeble beat. Ether is safer than chloroform if the patient is badly frightened—at least is safer at the commencement of the administration. Fear, like chloroform, is a strong cardiac depressant. Fear and chloroform together double the danger. If to their effects surgical shock be added, the total effect may be very dangerous. It is argued that death just previous to the administration of chloroform is not due to fright, because similar accidents do not take place preceding the administration of nitrous oxid. McCardie thinks, however, that it is a realization on the patient's part of the respective dangers of the two anesthetics which makes him fear chloroform and yet take nitrous oxid with impunity. It is also shown that nitrous oxid markedly raises the blood-pressure and does not depress the heart until the asphyxial feature has been in evidence for some time. The latter part of the address describes the anesthetization of certain groups of cases and the method of moving patients while under the influence of anesthetics. The greatest stress is laid upon the necessity of employing tact in approaching a patient, and upon the method of keeping him perfectly

¹ Birm. Med. Rev., March, 1903.

quiet and free from all disturbances, such as the sight of instruments and the presence of friends. One of the great objects is to reassure the patient, for just as he is when he "goes under" so will he continue to behave; that is, quiet induction generally means quiet narcosis. This applies particularly to chloroform. Reference is made to the work of Hess, who has shown that ether is excreted from the blood into the stomach and there acts as an irritant, causing vomiting. McCardie believes that ether, being excreted by the stomach-cells, produces acute gastritis, and that large quantities of ether vapor administered to animals will cause well-marked renal lesions. Hess, therefore, advises the administration of water just before anesthesia. Lewin advises, for the mechanical protection of the stomach against the action of chloroform, the administration of mucilaginous substances which will for some time adhere to the stomach. The most suitable mixture consists of 1 part of gum arabic to 2 parts each of water and tragacanth. The patient should take a dose of this 3 or 4 hours before, and another dose immediately before operation. McCardie closes with a suggestion regarding the therapeutics of atropin, which he thinks has not been sufficiently taken advantage of before and during chloroform-anesthesia. Atropin, as we know, paralyzes the ends of the vagi in the heart, and besides removing the drag of these nerves, it directly stimulates the heart and in moderate doses keeps up the force of its systole. It stimulates the vasomotor center and raises the blood-pressure. Thus, stimulation of the vagus, by chloroform or other means, can be entirely prevented by a proper dose of atropin. It has been found that dogs, under the influence of atropin, are decidedly more difficult to kill with chloroform than animals not so treated. Many continental anesthetists regularly inject atropin with morphin before beginning the administration of chloroform. [It is a matter of daily observation that emotion profoundly affects the circulation. During fear the heart becomes more rapid and frequent. The practical observations on this point in McCardie's paper are of much importance. Fear produces respiratory oppression, which is most marked in children; pallor of the face; tremor; vesical irritability; sweating. We know sudden death may occur from terror, and it seems certain that fear may so depress the nerve-centers that a few whiffs of chloroform may arrest the heart or respiration. Dr. A. Hobart Hare has for years insisted on the value of atropin, and we have long been convinced of the truth of his claim by ample clinical observation.]

Bad and difficult subjects for anesthetization are described by Hewitt¹ in two lectures. He deals first with those patients whose respiratory tract is in some way encroached upon or whose respiration is hampered by pathologic or other conditions. It is stated that it is more important, as a rule, to test the freedom of a patient's respiration, particularly through the nose, than to listen to the heart before giving an anesthetic. In these cases asphyxiating anesthetics or asphyxiation methods of administration should be avoided. For instance, pure nitrous oxid administered to a patient with angina Ludovici might act as a direct

¹ Lancet, Jan. 17, 1903.

poison. Generally speaking, chloroform or a mixture of chloroform and ether should be given to patients in this group, but in exceptional cases ether may be preferable. In cases of goiter, chloroform is the only permissible anesthetic. In certain cases of bronchitis and empyema, in which cyanosis and respiratory distress exist before anesthetization, the combination of oxygen with ether is a good one. These patients should be anesthetized in the posture in which respiration is most comfortable, and as little movement as possible should take place during the operation. If chloroform is carefully and gradually given in cases of bronchitis and empyema, anesthesia is, as a rule, attended with no great difficulty. Lengthy administration of an anesthetic in these cases is bad. Patients who have been confined to bed for a considerable time, owing to some constitutional disease, are not, as a rule, bad subjects for anesthetization. In cases of advanced heart-disease Hewitt considers the administration of pure nitrous oxygen to be contraindicated. Regarding so-called "nervous" patients, it is stated that the nitrous oxid-ether sequence is well suited to them. If chloroform is given, it should follow ether. Reference is made to the great difficulties encountered in anesthetizing alcoholics. In extreme cases of alcohol-indulgence nitrous oxid may be found practically useless as an anesthetic. In a number of cases Hewitt has met with nearly as much difficulty in anesthetizing patients addicted to the excessive use of tobacco as he has in alcoholics. In these cases he has been unable to devise any method of administration or combination of anesthetics which is perfectly satisfactory. The greater difficulty arises in cases in which there is found a combination of the difficulties already discussed; for instance, when an excellent muscular development is complicated by nasal obstruction or excessive smoking or drinking. The best plan, as a rule, in these cases is to employ the chloroform-ether sequence, or, if the ether is badly borne, the ether-chloroform sequence. Should the anesthetist desire to administer nitrous oxid and ether, it is essential first of all to insert a mouth-prop. It is very necessary in these cases of combined difficulties to provide for and maintain an oral air-way throughout. In closing, Hewitt refers to patients who exhibit peculiar idiosyncrasies under certain anesthetics. [Several times I have met serious embarrassment in anesthetizing heavy users of tobacco. It may occur in chewers or smokers. There may be trouble with the circulation or great respiratory embarrassment and rigidity of the jaws.]

Eisendrath¹ discusses the **accidents of anesthesia together with their prevention and treatment**. His remarks are summarized as follows: "(1) Chloroform has a narrower zone of safety than ether. Its toxic effects are as a rule manifest at the time of administration. Ether is the cause of death in many cases through renal or pulmonary complications from hours to days after the anesthesia. The late deaths due to chloroform are so rare as to render this factor practically of no importance. Chloroform is a more dangerous anesthetic than ether and must be watched far more carefully. (2) Chloroform kills more frequently through primary cardiac respiratory syncope, and the anesthe-

¹ Amer. Med., Nov. 15, 1902.

tizer must watch constantly the decrease in volume and rapidity of the pulse, indicating the fall of blood-pressure, and a slowing of the more shallow respiration. Chloroform syncope can be avoided by keeping the head low, if possible turned to one side, keeping the jaw forward, watching the pulse, respiration, and pupil, keeping the patient's mind quiet, and keeping the chloroform well diluted with air. (3) Ether rarely causes death through its immediate effects, but more frequently through its after-effects, such as pneumonia and uremia. These complications may be avoided by keeping the head lower than the level of the body, turned to one side, and not giving the ether in too concentrated a form; also by not keeping the patient on his back too long, and by relieving postoperative tympanites as soon as possible. The contraindications to the use of chloroform are myocarditis, pericardial adhesions, and non-compensated valvular disease. In all other forms of heart-disease it may be given. It should not be given when the blood-pressure is low or in status thymicus, or when a prolonged anesthesia is necessary. (4) The pulmonary complications are relatively more frequent with local anesthesia than if a general anesthetic is given. They may be due to aspiration of mucus or food, or due to hypostasis and to embolism. The latter is far more frequent than is ordinarily thought. Avoid these by exposing patients as little as possible. Use heated operating tables, avoiding recumbent position and tympany. (5) Avoid renal complications by careful examination of the urine before anesthesia. (6) Begin process of resuscitation immediately and systematically: Artificial respiration, the method of König-Maas, or massage of the heart, rhythmic traction of the tongue, method of Prus, or direct exposure of the heart and intravenous salt transfusion. I prefer to begin with massage of the heart and rhythmic tractions of the tongue (16 to 18 times a minute)."

Galloway¹ advises the use of **nitrous oxid alone as a preliminary to ether or chloroform** in general surgical work, and reports 250 additional cases in which this practice was followed. The average time for the patient to become unconscious in these cases was 2½ minutes. In no case, when ether was to follow, was administration of the gas continued for more than 3 minutes. In one case requiring 10 minutes the patient had a heavy beard, and this probably admitted air under the inhaler sufficient to produce the excitement and struggle during which the patient partly revived and had to be anesthetized with ether as if no gas had been used.

Chloroform as an anesthetic in short operations upon the throat and nose is discussed by Chaldecott,² who strongly condemns it, referring to 50 recent cases in which death had occurred in these otherwise simple operations. Even in the hands of an experienced anesthetist, chloroform in these cases is extremely dangerous. For infants less than 12 months old ether should be employed on an open mask. Children from 1 to 4 years of age do not take nitrous oxid well, especially if there is any obstruction of the respiratory tract. Ether in these cases is usually taken without trouble. From 4 to 12 years of age nitrous oxid is generally

¹ Amer. Med., Feb. 14, 1903.

² Lancet, Sept. 13, 1903.

satisfactory. This agent is also usually satisfactory in adolescents and adults. Gas and ether are rather to be preferred to gas and oxygen. Ethyl chlorid the author has employed in 80 cases, but considers it less trustworthy and more tedious to administer than ether. The best gag to employ in these cases is Doyen's, and it should be introduced before the administration of the anesthetic. The author closes with repeated advice against the use of chloroform in nose and throat work.

Recent improvements in general anesthesia are reported very carefully by Willy Meyer.¹ He pays particular attention to **anesthol**, which he has used very extensively. Anesthol is a clear, transparent fluid of very agreeable odor. It is a chemical combination of ethyl chlorid and M. S. (a combination of chloroform and ether), and not a mixture. Meyer first used anesthol in 1898 in an interval operation for appendicitis, since when he has used it extensively in hospital and private practice. The only exceptions were operations upon the face, in which pure chloroform was deemed preferable. At first his experience was that deep anesthesia was not caused and that muscular rigidity was sometimes troublesome. This objection, however, was readily overcome by administering $\frac{1}{4}$ grain of morphin hypodermatically prior to the administration of anesthol. The agent should be administered upon an Esmarch mask covered with sterile gauze and by the "drop-by-drop" method. It is necessary to continue the anesthetic throughout the entire course of the operation, as the recovery from it is very prompt. It is claimed for this agent that its administration is simple, not objectionable to the patient, and that few of the disagreeable and troublesome symptoms following other general anesthetics are seen. In his entire experience with the drug but 2 deaths have occurred, and one of these can certainly be accounted for by the condition of the patient. He has not hesitated to use the remedy in the presence of marked organic disease both of kidneys and heart. Guth has administered the anesthetic in 200 private cases for Meyer without any disagreeable results. [Anesthol has been used to a considerable extent at the Pennsylvania Hospital, and Gibbon's only criticism of it is that in abdominal surgery the rigidity of the muscles is not sufficiently overcome. This is obviated to some extent by the previous administration of morphin, but in a number of instances it has been necessary to change from anesthol to ether because of the persistent rigidity.]

W. J. McCardie² discusses **ethyl chlorid as a general anesthetic**, his remarks being based upon an experience of 620 cases. Heyfelder, in 1848, used ethyl chlorid as a general anesthetic, his example being followed by others. About 1880, however, the agent was tried as a general anesthetic upon animals by a committee of the British Medical Association, who condemned its use, claiming that it produced convulsions and arrest of respiration. About 1895 or 1896 the subject was again brought up by Carlson and Thiesing, and it was soon used extensively by other Europeans, particularly in dental work. Seitz, of Konstanz, in 1892 reported 16,000 cases of ethyl-chlorid narcosis gathered from the litera-

¹ Jour. Am. Med. Assoc., March 7, 1903.

² Lancet, April 4, 1903.

ture of the subject. But 1 death was reported, and that in a very unfavorable subject. This writer is a strong advocate of the use of ethyl chlorid, claiming that with the exception of nitrous oxid it is the safest of all the anesthetics, and that the death-rate is in the proportion of one to many thousand administrations. Its great volatility causes it to be quickly absorbed and almost as quickly eliminated. McCardie has assured himself from a large personal experience that arterial tension is, as a rule, lowered during the administration of ethyl chlorid, but that during deep narcosis the pulse becomes rather slower than normal, usually preserving its regularity. During deep anesthesia the respiration is markedly increased both in frequency and depth, and the color is improved, due to vasomotor dilation, sometimes resulting in sweating, and in one instance giving rise to a well-marked rash, like the ordinary ether rash. Both adults and children take ethyl chlorid very well and quietly, and come under its influence very rapidly. Trouble during the induction of anesthesia is sometimes encountered in hysteric people, drinkers, smokers, and muscular subjects. McCardie lays emphasis on the fact that if excitement takes place, it is due to the too free admission of air, and yet a free use of air should be allowed. Failure of the anesthetic is also traceable to the too free mingling of air with the vapor. It has been asserted that tea-drinking is more productive of excitement than alcohol, and that coffee-drinking tends to cause vomiting. Upon first using ethyl chlorid as an anesthetic the writer used Breuer's mask, but has recently employed Ormsby's ether inhaler, and in 350 cases has known of but 1 instance of great mental or muscular excitement, which occurred in a young man who had just been drinking freely. With this inhaler anesthesia is much more quickly produced. The most useful form is that devised by Hewitt, containing a movable air-chamber which can be heated in hot water and, lying against the sponge, prevents it from freezing, which is likely to occur when either ether or ethyl chlorid is used. McCardie has mostly used kelene or Henning's ether chloratus pro narcosi. The vapor of ethyl chlorid is not objectionable. The author has given it to himself and finds the subjective symptoms as nearly as possible those of nitrous oxid. He has mostly employed the drug for anesthesia in the removal of adenoids and tonsils or in dental extractions, but once employed it in an operation requiring 26 minutes. The drug has been used by many Europeans for much longer operations, such as herniotomy, etc. Ethyl chlorid produces a larger pupil during early deep anesthesia than is seen with other anesthetics. If anesthesia is not induced in less than a minute to a minute and a quarter, it is because air is being too freely admitted to the inhaler or else insufficient ethyl chlorid is being given. For continuation of anesthesia 2 cc. or 3 cc. is sprayed on every 2 or 3 minutes, and air is admitted at frequent intervals, as the state of the patient may require. The rapid production of anesthesia is sometimes startling, occurring in one instance after 6 full breaths of ethyl chlorid. In operations upon the nose and throat McCardie prefers the patient to assume the recumbent posture, the head being somewhat lower than the body. In none of the 620 cases mentioned has

he noticed any syncope, either respiratory or cardiac, the only difficulty arising during the operations being from obstruction of respiration, the result of blood or the falling back of the tongue. The drug occasionally produces headache and vomiting. When full anesthesia is employed the muscles are almost invariably flaccid, although rigidity has been complained of by a number of writers. The writer has used the French preparation called "somnoform," composed of 60 parts ethyl chlorid, 35 parts methyl chlorid, and 5 parts ethyl bromid. He found the results, however, to be practically those of ethyl chlorid. Reports are given of a number of cases of particular interest in which anesthesia has been produced by ethyl chlorid with the greatest satisfaction where nitrous oxid and ether had been badly taken or were unsuccessful. The only contra-indication to the administration of ethyl chlorid is marked narrowing about the larynx, in which cases chloroform is a better anesthetic, as being less stimulating. The drug is a perfect anesthetic for small operations in children. McCardie has used ethyl chlorid with satisfaction as a preliminary to ether, but has never given it as a preliminary to chloroform. The recovery from the anesthesia is very prompt and complete. [An objection to ethyl chlorid in many cases is the rarity of complete muscular relaxation. Sometimes it fails to produce complete unconsciousness.]

Solenberger¹ discusses **ethyl bromid** as a general anesthetic in the removal of **adenoids and tonsils**. The drug should only be used in properly selected cases, and therefore has definite limitations. The following rules are given for the use of ethyl bromid: (1) Do not use ethylene bromid. (2) Do not use an old or impure solution. (3) Do not administer it in repeated and small quantities. Give *en masse*, admit no air. (4) Do not continue its administration longer than 1 minute. Rapidity of operation is another essential to success in the use of ethyl bromid, and to this end a small and accurate instrument must be used. The writer presents photographs and a description of an instrument which he has found useful.

Schicklberger² has tested the **morphin-scopolamin anesthesia** (Schneiderlein) in 11 cases and is somewhat disappointed. In most of the cases he made 3 injections of 1 cg. of morphin-hydrochlorate and 0.5 mg. of scopolamin-hydrobromate. The first injection was made about 4 hours, the second about 2 hours, and the third about $\frac{1}{2}$ hour before operation. The operations done under this anesthesia were very varied, a number of them being abdominal operations. The first effect of the drug was observed in about 10 or 15 minutes, and was marked by giddiness and suffocation, with a gradually developing hyperemia of the face, mydriasis and sluggish action of the pupils. The pulse-rate became later very much accelerated. After a third injection there was no disturbance of the breathing nor of the stomach, but the patients were often very restless, interfering considerably with the operation, especially on the abdomen. The duration of the sleep was from 3 to 8 hours, and when it was over the patient remained somewhat muddled for a time. Tachycardia in some of the cases did

¹ Jour. Am. Med. Assoc., April 18, 1903.

² Wien. klin. Woch., Dec. 18, 1902.

not disappear for 36 hours. In a number of the cases when muscular relaxation was desired the drug was altogether insufficient. In 7 of the 11 the anesthesia was not sufficient for the completion of the operation, and in these an inhalation-anesthesia had to be resorted to. The author thinks that morphin-scopolamin in anesthesia might be found useful in those cases in which both chloroform and ether were contraindicated, but that its action is not sufficiently satisfactory to ever take the place of these anesthetics. [Recently Wild has reported alarming results from scopolamin-morphin anesthesia, employed in König's clinic by the method of Bloss.¹ He points out that it is dangerous to induce anesthesia by this method without careful preliminary trial to determine the necessary dose for an individual. Even an hour or two after the operation respiratory failure may occur. It may be necessary to complete the anesthesia with ether.]

William M. Perkins² has collected 2345 cases of **spinal analgesia** including 27 cases in which this method was employed by either Parham or himself. Of the 2345 cases collected, 16 patients died. It is not thought, however, that these figures are sufficiently large to warrant one in supposing that the mortality is 1 in 146 cases, as they would indicate. Of the 27 cases of Parham and the author, 18 were satisfactory, 7 were partly satisfactory, and 2 were failures. Cocain was used in all cases in this series, eucain-B only being used in 1 case, and even then followed by cocain. A 2 % solution was used in almost all the cases. The injections were from 10 to 40 minims, the total amount varying from $\frac{1}{2}$ grain to nearly 1 grain. The most frequently used injection was about 10 or 15 minims of a 2 % solution of cocain muriate, containing $\frac{1}{2}$ grain to $\frac{3}{10}$ grain of the drug. No symptoms of spinal infection followed in any case. It was found by making the patient alternately straighten and bow the spine that the fourth lumbar interspace could be much more easily located. The results in this series of cases would indicate that analgesia may be expected to begin in 10 minutes or less and to be complete in from 10 to 20 minutes, although it often takes longer to become complete as far up as the umbilicus. In one of these cases it apparently occurred over an hour after the injection. The duration of the analgesia was usually over an hour, though sometimes it lasted scarcely half an hour. The analgesia usually extended about as high as the umbilicus or nipple, but in a few cases it was noticed as high as the arm, throat, and even scalp. Paresthesia usually appeared before analgesia, the first symptom of successful analgesia often being a tingling and numbness of the feet. In the majority of cases in which the method was employed there was some special contraindication to the use of a general anesthetic. Of the 7 partly successful cases, the 4 following are worthy of special note: Case III: Analgesia, though delayed, did finally appear. Case VI: The dilation of the sphincter, which was the main reason for the analgesia, was accomplished with comparatively little pain, although the legs were not analgesized. Case XVII: A full-sized straight Keith needle

¹ Berl. klin. Woch., March 2, 1903.

² New Orleans M. and S. Jour., Sept., 1902.

was thrust through the skin of one of the patient's legs and he was perfectly unconcerned. From the time the word "knife" was spoken, he became increasingly nervous and hysteric. Case XXVII: Satisfactory analgesia, but extreme nausea and vomiting accompanied by collapse. Nausea was disagreeably present in less than one-third of the cases, and headache in only a few. The method would seem to be contraindicated in children and in hysteric or very nervous patients. Morphin hypodermatically before the operation may materially increase the usefulness of this method. Strychnin and digitalis should be used as the pulse demands. Hyoscin hydrobromate is often useful in preventing disagreeable after-effects. Perkins states that "the method of inducing analgesia evidently has its advantages, but the question of the relative mortality to that of other methods must be carefully determined." [We believe that deaths from this method are by no means rare, and that it should only be employed when other forms of anesthesia are positively contraindicated. Cases have been reported which suggest the possibility that the cord may sometimes be permanently damaged by the injection.]

Kozlowski,¹ after referring to the complicating sequels of **spinal anesthesia**, describes a method which he believes prevents these. Into a dry sterilized graduate is placed 0.05 gram of tropacocain in powder form, and upon this the cerebrospinal fluid is allowed to fall as it passes through the needle. When 5 grams have escaped a tropacocain solution of 1 % is made in the fluid and at once injected. The drug dissolves with very little shaking. The author uses Merck's tropacocain directly from the bottle without any sterilization, and has seen no bad effects from not sterilizing it. Guinard has also employed the cerebrospinal fluid as a menstruum for the cocain, but he first dissolves the drug in a small amount of water. [A. W. Morton,² of San Francisco, has for a long time advocated the use of the cerebrospinal fluid to dissolve the cocain.]

E. Denegre Martin³ discusses **spinal analgesia** and reports 18 cases in which he has used a more concentrated solution of cocain than is generally employed. It is the author's custom to inject 5 minims of a 2 % or 4 % solution of cocain, thereby disturbing the tension just as little as possible. Only 1 or 2 drops of cerebrospinal fluid are allowed to escape before the injection is made. The patient's head and shoulders are elevated upon the operating table and this position is maintained for several hours after the operation or until all effects of the cocain have disappeared. Martin's experience is that one-tenth of a grain (5 minims of a 2 % solution) is sufficient for all operations about the rectum, but that more is required for operations on the extremities. Brief notes of the 18 cases referred to are presented.

A. W. Morton⁴ briefly describes a case of **excision of the superior maxillary bone under medullary narcosis**. The operation was done for cancer. The patient was a man of 39 years. One-half grain of cocain dissolved in cerebrospinal fluid was injected between the third and fourth lumbar vertebrae. Analgesia was complete in about 20 minutes, and the

¹ Centralbl. f. Chir., Nov. 8, 1902.

² Jour. Am. Med. Assoc., Nov. 8, 1902.

³ New Orleans M. and S. Jour., April, 1903.

⁴ Amer. Med., March 21, 1903.

operation, which required the employment of bone forceps and chisels and also the Paquelin cautery for the control of hemorrhage, was borne by the patient without any expression of pain, and when the operator spoke of the possibility of a recurrence in the other side, the patient requested him to remove this bone also if it was necessary. Throughout the operation the patient was able to expectorate the blood which accumulated in the pharynx or to retain it until it was wiped away.

Gibbon¹ reports a case of **painless amputation of the leg after the intraneural injection of cocain**. The patient was a man aged 50 years, who suffered from tuberculosis of the ankle-joint, and to whom it was thought unwise to administer a general anesthetic. The method employed was that described by Crile,² and successfully practised by him and by Matas. In the case reported the sciatic and anterior crural nerves were exposed and injected by the infiltration method with a 1 % solution of cocain. Amputation of the leg was then proceeded with and accomplished without complaint of pain on the part of the patient and without his knowledge. No shock was noted after the operation and the patient made a good recovery. Gibbon states that he was very much impressed with the success of the method, but warns those unfamiliar with infiltration-anesthesia against its employment in extensive operations. The technic of infiltration should be carefully studied and successfully practised in small operations before it can be employed in the more extensive ones with any degree of satisfaction. The solution used must be pure and fresh and the technic perfect in order to give good results. "Crile learned by his experiments that a 1 % solution of cocain injected into a nerve-trunk produced in a few minutes an absolute physiologic 'block' to both efferent and afferent impulses, and that hence any operation might be done on the parts supplied by the nerve without the production of shock. This is certainly more than can be claimed for any general anesthetic, these agents but slightly influencing the afferent impulses which produce the shock. Crile states that the general anesthetic abolishes the afferent impulses which produce pain, but does not abolish those affecting the vasomotor, respiratory, and cardiac mechanisms. He says the injection may be looked upon as a temporary physiologic amputation of the part. By the intraneural injection method Crile has amputated 5 times below the knee, once at the shoulder-joint, and once he removed the entire upper extremity with satisfaction."

George Y. Myrtle³ reports 4 cases showing the danger of **cocain used externally**. In these cases the injurious effects followed the local use of cocain, and in 2 of them after a single application.

Frederick Griffith⁴ reports a typical case of **poisoning following the use of cocain as a local anesthetic**. According to a rough estimate, from 2½ to 3 grains of cocain was injected. The cause of the poisoning in this case was that it was found necessary to use a larger amount of the infiltrating solution than was at first supposed and the strength of the solution was not changed.

¹ Phila. Med. Jour., May 2, 1903.

³ Quarterly Med. Jour., Aug., 1902.

² YEAR-BOOK OF SURGERY, 1903.

⁴ Amer. Med., March 7, 1903.

Braun¹ relates the results of extensive experimentation regarding the **action of adrenalin in local anesthesia**. A solution of adrenalin alone does not produce local anesthesia, but when added to solutions of cocain or eucaïn it increases the anesthetic property of these drugs to an extraordinary degree. Experiments upon animals demonstrate the fact that the toxic effects of cocain are greatly diminished by the addition of adrenalin. Tropacocain and adrenalin were found to be incompatible, the latter losing the vaso-constricting qualities in the presence of tropacocain. Adrenalin added to cocain and eucaïn not only increases but considerably prolongs the anesthesia. When this combination is used, the anesthesia does not cease for from 20 to 30 minutes after the injection is made. As a general rule the amount of adrenalin injected at one time should not exceed 15 drops of a 1 % solution. Three drops of a 1 % adrenalin solution added to a cubic centimeter of a 1 % solution of cocain was found useful for teeth extraction, but the full effects of the injection were delayed for 10 minutes.

ESOPHAGUS, STOMACH, AND DUODENUM.

James P. Marsh² discusses the rare condition of **congenital absence of the entire esophagus** and describes a case coming under his care. After a careful investigation of all reported cases Marsh estimates the number of instances of entire absence of the esophagus at 5. The symptoms in all these cases were practically the same. The child appeared perfectly normal, but after taking a mouthful of milk or water was seized with a severe attack of strangling and became cyanotic. Repeated attempts at nursing were followed by similar attacks. The bowel movements became gradually less in amount and the secretion of urine was diminished. Emaciation was rapid and death followed from starvation. Toward the end inspiration-pneumonia occurred in quite a large proportion of the cases. The diagnosis is made sure by the passage of a catheter into the esophagus. The diameter of the esophagus of a new-born child is 4 mm.; from the border of the gums to the cardiac orifice the distance is 17 mm. Marsh thinks that the passage of an instrument is not without danger, as there is considerable liability of its entering the trachea or a bronchus. The only treatment that is possible is surgical, and consists either in the establishment of an opening from the blind esophagus into the stomach or the performance of gastrostomy. Where there is absolute absence of the esophagus the only operation to be considered is that of gastrostomy. The only case thus treated is that of Charles Steele, who performed the operation upon a child 24 hours old. The child died 24 hours after the operation. Brief notes of all the cases reported conclude Marsh's article.

Fatal perforation of the esophagus in a young girl is illustrated by a case of Tirard's.³ The patient was a girl 19 years of age, admitted

¹ Münch. med. Woch., Feb. 24, 1903.

² Am. Jour. Med. Sci., Aug., 1902.

³ Lancet, July 12, 1902

because of cough accompanied by nausea, but no expectoration. Later the expectoration of a large quantity of yellow, purulent, offensive sputum occurred. The chest symptoms continued until it was finally determined that the patient might be suffering from a localized empyema or a lung-abscess. Mr. Barrow operated, but was unable to discover pus. At the autopsy a smooth, round hole, the size of a No. 8 catheter, was found in the anterior wall of the esophagus at the bifurcation of the trachea, and led into an abscess-cavity in the mediastinum. This cavity was about the size of a hen's egg; its walls were ragged and gray, and it was the seat of a gangrenous odor. There was also found an aperture into the right bronchus about 1 inch from the bifurcation.

Three cases of **perforation of the esophagus** are reported by Riviere.¹ The author made a postmortem examination in each of the 3 cases. The patients were all under 2 years of age. In each the perforation occurred near the bifurcation of the trachea, and it was the gland or glands situated below the bifurcation which caused the trouble. In each of the cases abdominal tuberculosis was a striking feature. In one there were tuberculous ulcers in the stomach, a very rare condition. In all 3 there were intestinal tuberculous ulcers and caseous mesenteric glands, and in 2 the retroperitoneal glands were also caseous, a condition which is by no means common. In 2 of the cases the gland below the tracheal bifurcation had completely emptied its caseous contents, leaving its cavity smooth-walled and apparently lined with mucous membrane. The author is inclined to think that many cases of esophageal diverticulum occurring at this situation are due to such a cause.

Symonds² presents an instructive discussion of the **diagnosis and treatment of malignant stricture of the esophagus**. The diagnosis of the condition is summarized as follows: "(1) Among early symptoms we may have so-called dyspepsia, nausea, and repulsion for food; pain alone when the central district is affected. (2) The passage of a bougie is the only way to clear up the case, and its employment need not be feared. (3) Extraesophageal disease rarely gives rise to serious dysphagia. (4) Spasmodic obstruction, apart from the hysteric form, has always, when decided, an organic cause, and this would be better called intermittent dysphagia. (5) With regard to the three special districts, it may be said (a) that all organic obstruction in the upper third is malignant and has a special tendency to cicatrize; (b) that in the central half of the gullet a sarcoma or a myoma, both rare diseases, may cause fatal obstruction, and here also a pouch may give rise to difficulty in diagnosis, but can generally be excluded; and (c) that in the lower difficulty was encountered in passing the first long feeding-tube. The rubber form was easily introduced after a few days' residence of the silk-web tube. From time to time small pieces of the rubber tube had to be removed, as it split near the silver cannula. The patient died with the original tube in position." The general question of treatment as applying to all cases is stated as follows: "(1) While the patient can swallow fluids and semisolids, and while a bougie can be passed and plenty of

¹ Brit. Med. Jour., Jan. 24, 1903.

² Lancet, Aug. 9, 1902.

nourishment taken, he may be let alone so long as (a) he can swallow well or (b) a small bougie, No. 12 catheter gage, can be passed. (2) If the dysphagia increases, even though a bougie can be passed, then a tube must be inserted or gastrostomy must be performed. These conditions are seen in the soft fungating forms. (3) If a bougie cannot be passed or goes with difficulty, then the same course must be followed, as we know that complete closure may occur at any time. (4) If both conditions arise,—i. e., the patient cannot swallow and a bougie cannot be passed,—then immediate mechanical treatment is required." The passage of bougies is not advocated with the view of dilating the stricture. Employed in this way their passage irritates and leads to increase of obstruction. A small bougie is employed simply to secure the route, so that at any time a tube can be passed for feeding purposes or the time fixed for gastrostomy. The passage of a tube should be attempted after a night's rest and a dose of opium. The longest time which Symonds has known a rubber tube to remain unchanged was 13 months. He has now under treatment a patient who has worn a tube for 11 months and a tracheal tube for 4½ months. When the disease involves the lower end and cardiac orifice, treatment by the tube is difficult and early gastrostomy is to be recommended. The short tube is useful in strictures occurring at a point 10 inches to 14 inches from the teeth. The tube is of no use when cough or swallowing indicates perforation of the respiratory tract. A reference is made to the accidents which accompany attempts at intubation of malignant esophageal strictures, such as forcing a passage into the trachea. The employment of the laryngoscope to ascertain the position of the tube in cricoid strictures is of the greatest help in avoiding accidents, especially when a general anesthetic is employed. A short tube is serviceable in a fair number of cases of disease of the central portion of the esophagus, and when it acts well is superior to any other method. It must be replaced by a long feeding-tube when pulmonary symptoms arise. The tube should be kept continuously in position, and if for any reason it is to be changed the new tube should be inserted at once.

J. G. Emanuel¹ relates the history of 6 cases of **cancer of the esophagus without obstructive symptoms** that occurred in the City of London Hospital from the years 1897 to 1899, inclusive. Dysphagia in these cases was altogether absent or else obscured by other more prominent symptoms. Three of the patients sought admission because of laryngeal symptoms, 3 hoarseness or aphonia, and in 2 of these cough and expectoration were present. Shortness of breath, cough, and expectoration were the cause of admission in a fourth, and hemoptysis accounted for the admission of another. In the sixth case there was vomiting, which was apparently due to a simple gastritis, and which was not accompanied by any difficulty in swallowing. Those cases presenting any trouble in deglutition showed that the difficulty was not associated with trying to get food through a stenosed esophagus, but was caused by perforation of the trachea, bronchus, or lung by the growth. Great im-

¹ Lancet, Oct. 18, 1902.

portance is attached to this form of dysphagia which is characterized by reflex paroxysmal cough immediately after swallowing. The importance of recognizing this symptom is obvious, for although the patient may succeed in getting part of the food into the stomach, some will find its way into the air-passages and sooner or later set up an inhalation-bronchopneumonia. In 2 of the cases reported the growth was in the upper part of the esophagus and caused perforation of the trachea; in 3 it was opposite the bifurcation of the trachea and perforated the left bronchus; in 1 case it was at the lower end of the esophagus and perforated the lung itself. In 3 cases death was caused by inhalation of food into the air-passages, which set up a septic bronchopneumonia in 2 cases and a septic bronchitis in the third. The death of another patient was due to pneumothorax, and of another to pyopneumothorax, and in the last case to hemorrhage into the left bronchus. This series illustrates well the frequency with which laryngeal paralysis forms an early symptom of esophageal growth. This laryngeal paralysis has a special importance when the symptoms of obstruction are absent, and may lead to a correct diagnosis when there are no other definite symptoms to be found. A complete history of each case concludes the article.

C. B. Lockwood¹ describes the treatment of a case of **so-called idiopathic dilation of the esophagus**. The case had been previously reported by James Swain as a case of idiopathic dilation. A full-sized esophageal tube always passed with ease and never became entangled. The esophagus was filled with about a pint of rather thick fluid with some bismuth in suspension, and then the shadow of the dilated esophagus was plainly seen with x-rays. The dilation was fusiform and reached from about the left bronchus to the diaphragm. Acting upon the assumption that the dilation of the esophagus was secondary to systematic contraction of the cardiac orifice, Lockwood determined to try the effects of stretching. He had an instrument constructed which consisted of an ordinary esophageal tube with a distensible rubber bag around the last 4 or 5 inches of its stomach end. This bag was distended with air by means of an ordinary air-pump, the air being transmitted by a small tube which ran down inside of the esophageal tube. As the patient had been accustomed for a long time to the passage of a tube for the purpose of feeding, there was no difficulty in using the instrument. The patient, after the frequent use of this instrument, was able to partake plentifully of food and gained a great deal in weight.

A. J. Ochsner² presents some **clinical observations on stomach surgery**. It is stated that ultimately stomach surgery will consist chiefly of operations for gastric ulceration or for one of its various sequels, hemorrhage, perforation, adhesions, etc. Operation for the relief of sequels, however, will not be so frequent as at present because of the growing favor of early operative treatment of ulcer. The greatest credit is due to Mayo for firmly establishing in gastroenterostomy the principle of providing drainage of the stomach at the very lowest portion of this organ. Ochsner states that since observing this principle he has not

¹ Brit. Med. Jour., June 13, 1903.

² Jour. Am. Med. Assoc., June 6, 1903.

been troubled with persistent vomiting after gastroenterostomy. He believes that if the proper point of the stomach is chosen for anastomosis with the bowel, all the complicated operations for the prevention of post-operative persistent vomiting will be unnecessary. In the majority of his own cases Ochsner has employed the Murphy button, but in 9 cases operated upon during the present year he has employed the McGraw elastic ligature, and has found the method exceedingly easy and satisfactory so far as immediate results are concerned. None of the patients showed shock, all were able to sit up in bed the day following operation, and all recovered. The duration of time since the operation, however, has been too short in these cases to speak of ultimate results. In employing the McGraw elastic ligature the following rules should be borne in mind: "(1) A round rubber cord 2 mm. in diameter, made of the best material, should be used. (2) A posterior row of Lembert sutures is applied. (3) A long, straight needle armed with the rubber ligature is passed into the lumen of the intestine and out again at the desired distance, from 5 to 10 cm. away from the point of introduction. (4) While an assistant holds the intestine the surgeon stretches the rubber in the needle, and when quite thin draws it rapidly through the intestine. (5) The same step is repeated through the stomach. (6) A strong silk ligature is placed across and underneath the rubber ligature between the latter and the point where the stomach and intestine come together. (7) A single tie is made in the rubber ligature after it has been drawn very tightly. (8) The silk ligature is passed around the ends of the rubber ligature where they cross and tied securely three times. (9) The ends of the latter are released and cut off, being held by the silk ligature. (10) The Lembert suture is continued around in front until the point of its beginning is reached, where it will be tied. (11) Care must be exercised to prevent tying the rubber ligature too far backward and thus getting behind the posterior row of Lembert sutures." It is found that in gastroenterostomy done with a Murphy button the opening will remain patulous and act perfectly in cases in which the pylorus is permanently occluded, but in cases in which it is only temporarily obstructed the gastroenterostomy opening contracts as soon as the pylorus again becomes normal, or nearly so. Unfortunately this closure of the gastroenterostomy opening is likely to be followed by a recurrence of the ulcer, necessitating possibly a repetition of the operation. The operation of pyloroplasty has not been found very satisfactory, but the operation of Finney seems to promise very well. Finney's operation is easy of performance and the cases reported show good results. Regarding the various operations for gastropotosis, Ochsner states that the majority of those devised with the object of elevating the stomach are faulty because they interfere with the mobility of the organ. The operations of Beyea and Bier, which consist in the shortening of the gastrohepatic and gastrophrenic ligaments, do not possess this objection. When the pylorus is obstructed by cancer, there is never any indication for performing complicated operations. After removing the pylorus, the cut surfaces of the duodenum and the stomach should be completely closed by the inversion of

the edges, and a separate gastroenterostomy be made at the lowest part of the remaining portion of the stomach. When a cancer is so extensive as to render impossible complete removal, it is much better for the patient to have gastroenterostomy performed. Gastrectomy must ever remain a rare operation, because cases in which the disease is sufficiently advanced to cause the surgeon to consider this operation are usually so far advanced that even complete gastrectomy is useless. Ochsner calls attention to the method which he has found of the greatest use in preparing a case of obstruction of the pylorus for operation. Often these patients are so emaciated and weakened from want of nourishment that an operation cannot be done. He states that if the stomach is carefully washed out every 3 to 6 hours and a small amount of predigested food introduced, in addition to the administration of food by the rectum, the patient will greatly improve in strength. Unless the pylorus has been entirely occluded it is well to inject 2 ounces of olive oil once a day, as the oil will find its way into the intestine and aid the nutrition of the patient. The greatest care should be employed in using gastric lavage after operation, a half-pint of salt solution being quite sufficient.

Bevan¹ gives a review of the history and the present status of surgery of the stomach. The surgery of the stomach is discussed under 4 heads—operation for malignant disease, operation for benign pathologic conditions, operative treatment of wounds of the stomach, and removal of foreign bodies. Each of the various operations is briefly discussed, and the author concludes by making a plea for a wider application of operative procedures to lesions of the stomach. Disappointing as is the surgery of malignant disease, yet to-day operation is our only hope in these cases. Certainly the surgery of benign lesions has given brilliant results. It is capable of doing much more than even it is doing to-day. In almost every community patients afflicted with ulcer of the stomach die from obstruction, perforation, or hemorrhage, who could be saved by timely operative interference. Such patients are entitled to the benefits of modern surgery, and they will obtain it if the surgeon can convince the general practitioner of the possibilities for good in radical treatment. These cases are on the borderland between medicine and surgery, and the best results can be obtained only by the helpful cooperation of surgeon and physician; never by indiscriminate operating, nor by protracted routine medical treatment, but by the judicious selection of the treatment required to cure the individual case.

In an address on **gastroenterostomy and its uses**, A. W. Mayo Robson² refers to the high mortality presented by this operation between 1881 and 1885 (65.71 %). At present he sets the mortality at under 5 %. In preparing the patient for operation it is said to be generally unnecessary to put him through a severe course of preliminary treatment, such as frequent lavage of the stomach and prolonged abstention from food before operation, as such treatment is exhausting to weakened patients. Cushing has shown also that the stomach-contents speedily become aseptic if the mouth is repeatedly cleansed and if only aseptic

¹ Jour. Am. Med. Assoc., Jan. 24, 1903.

² Lancet, Feb. 28, 1903.

foods are administered, and clinical experience shows that elaborate preliminary treatment is not an essential to success. Robson prepares his patients by carefully cleansing the mouth and teeth and administering sterilized foods. About 12 hours before operation the last light meal is given, the stomach is washed out about 2 hours and a nutrient enema given about 1 hour before operation. The enema consists of brandy 3j, liquid peptonoids 3ij, and normal salt solution 3x. Great care is taken to avoid exposure to cold while on the operating table, and strychnin is administered to anticipate shock. The author prefers posterior gastroenterostomy except when the posterior wall of the stomach is rendered inaccessible by adhesions or by involvement in a malignant growth. By this operation free drainage of the stomach into the bowel is produced and exact apposition by posture of the newly joined structures is secured. Any complicated method of operation is usually unnecessary and should be avoided. The point on the bowel for anastomosis preferred by the writer is in the anterior operation 13 inches and in the posterior operation from 6 to 9 inches from the commencement of the jejunum. In the former operation a point is selected on the stomach near the pylorus and as near as possible to the greater curvature. After the completion of the anastomosis a few additional stitches are introduced into the proximal end of the loop to secure it at a higher level on the stomach-wall, and also into the distal end, securing it at a lower level in order to prevent kinking. Robson prefers a simple suture or his bone bobbin for effecting the anastomosing; he does not like the Murphy button. When a continuous suture is used, it is well to interrupt it at several points in order to avoid drawing or puckering of the orifice. A description is given of the method of removing a portion of the mucous membrane from both bowel and stomach. This prevents contraction of the opening and has given satisfactory results in Robson's cases. Among the complications which may follow the operation, regurgitant vomiting is first mentioned. It is more frequently met with in malignant than in simple disease, but its cause is difficult to determine. It is best controlled by lavage, placing the patient in the semi-erect posture, abstinence from mouth-feeding, and securing free action of the bowels. It is sometimes relieved by the free administration of milk or some other fluid. Robson quotes numerous authorities to show that the vomiting is not due to the presence of bile in the stomach. He believes that this regurgitant vomiting is dependent upon obstruction to the onward passage of the intestinal contents, an obstruction caused either by kinking or paralysis of the anastomosed jejunal loop, or later by adhesions. Another and a later complication is contraction of the new orifice. This occurs more or less in all cases in which the stomach is markedly dilated at the time of operation. Robson has not found that pneumonia and pleurisy have followed operations on the stomach with greater frequency than other operations upon the abdomen. Cases of peptic ulcer in the jejunum after gastroenterostomy have been reported by several writers. Adhesions subsequent to gastroenterostomy causing intestinal obstruction are probably uncommon. Failure of union in the newly joined structures

is a serious and almost always fatal accident, but is now seldom seen. It was much more frequent when operations were not done until the patients were moribund. Robson believes it is less likely to occur when a double line of sutures has been employed than when a Murphy button has been used. The passage of the small intestine through the loop formed by the junction of the jejunum and stomach has been reported by Mayo, but is only possible after the anterior operation. As regards the condition of the patients subsequent to operation, it is usually found that the peristaltic power of the stomach immediately improves, although it never becomes normal. Conditions of hyperacidity and anacidity are not changed by the operation. We thus learn that these conditions are dependent upon changes in the mucous membrane rather than on obstruction. If dilation has not lasted for too great a time, it will certainly be overcome. When there is great dilation of the stomach and the duodenum is mobile these two portions of the alimentary canal may be united, the operation causing but little disturbance on exposure of the viscera. This plan is not possible, however, when the pyloric region is extensively diseased or adherent. The fact that contraction occasionally follows pyloroplasty, especially if there is active ulceration at the time of the operation, has led Robson to prefer gastroenterostomy, although on many occasions he has done gastroduodenostomy with excellent results. He is a strong advocate of gastroenterostomy for irremovable malignant stenosis of the pylorus, and emphasizes this inclination by reporting a number of cases markedly benefited by the operation. It is believed that a degree of congenital stenosis is a frequently unrecognized cause of dilation of the stomach in young adults. Several cases are reported to impress upon surgeons the fact that a hopeless prognosis after gastroenterostomy for tumor should not be hastily made; it is well to give the patient the benefit that is derived from the hope of cure if there is any possible doubt as to the malignancy of the growth. In cancer and other tumors of the duodenum producing obstruction to the onward passage of the stomach-contents, gastroenterostomy is preferable to resection; in hour-glass contraction of the stomach gastropasty is in many cases the preferable operation, but if the stricture be a long one and there is extensive thickening, gastroenterostomy is the better operation. One must be careful in these cases to make sure that the intestine is anastomosed to the proximal portion of the stomach. The mistake has been made on several occasions of attaching the bowel to the distal portion. In perigastric adhesions the operation of gastrolisis is usually entirely curative, but when the adhesions are extensive, dense, short, and firm, posterior gastroenterostomy should be performed. When, in acute or chronic gastric ulcer, medical treatment is not productive of benefit, gastroenterostomy will in many cases give excellent results, but the operation must be determined on after considering the situation and condition of the ulcer. Robson will subsequently report a series of cases of duodenal ulcer treated by gastroenterostomy. When gastric or duodenal hemorrhage is not cured by general medical treatment, operation for the finding and securing, if possible, of the bleeding point, or the performance of

gastroenterostomy, is indicated. In persistent spasm of the pylorus, or Reichmann's disease, Robson has abandoned the operation of stretching



Fig. 11.—Gastrojejunostomy with the McGraw elastic ligature. Approximation of serosa with continuous silk suture (Walker, in Jour. Am. Med. Assoc., Jan. 17, 1903).

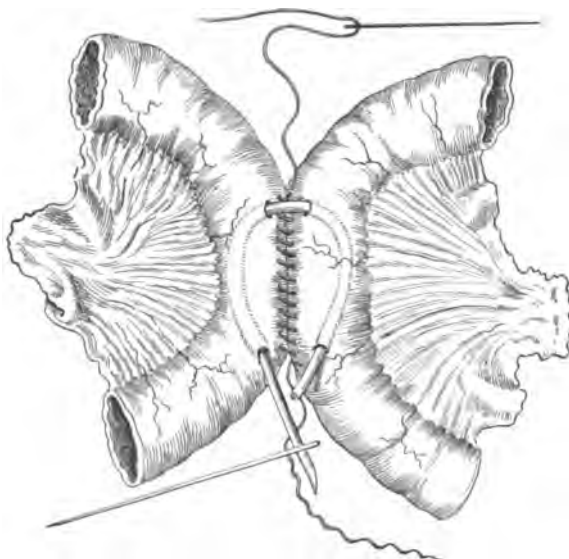


Fig. 12.—Gastrojejunostomy with the McGraw elastic ligature. Elastic ligature introduced (Walker, in Jour. Am. Med. Assoc., Jan. 17, 1903).

the pylorus and favors gastroenterostomy. As a rule, hyperchlorhydria responds to medical and general treatment; but if it does not, and the

life of the patient is made miserable, it is well to consider gastroenterostomy. Robson refers to a case of persistent gastralgia in which the condition was unrelieved by all medical measures, but which made a good recovery and was ultimately restored to health after the performance of gastroenterostomy. Tetany occurring in those suffering from gastric dilation is undoubtedly very serious, the mortality being nearly 75 %. Satisfactory results are reported in a case in which pyloroplasty was performed. Acute gastric dilation is one of the most serious diseases that can be encountered. In the Leeds General Infirmary during the past 10 years there have been at least 4 fatal cases. Robson mentions a case in which this condition arose and was relieved by the prompt use of lavage; but should this treatment fail to give relief, Robson says that

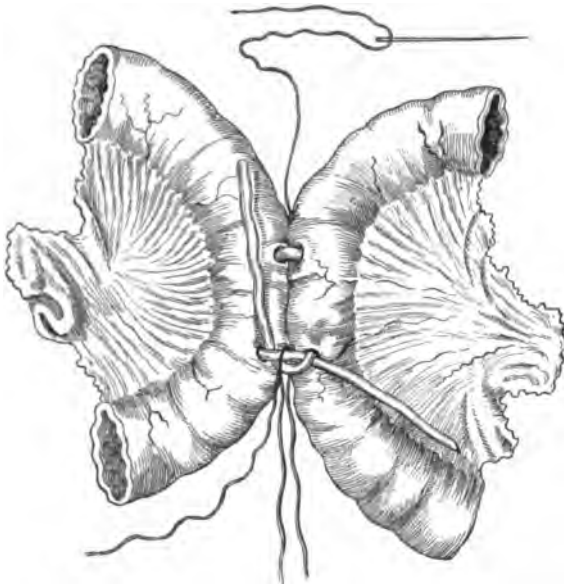


Fig. 13.—Gastrojejunostomy with the McGraw elastic ligature. One tie of the elastic ligature with a strong silk ligature underneath ready to fasten the elastic ligature where it is drawn taut (Walker, in *Jour. Am. Med. Assoc.*, Jan. 17, 1903).

rather than let the patient die the stomach should be opened and be connected with the jejunum. He knows of no case in which this operation has been performed. In conclusion, the author states that, if the procedure of gastroenterostomy is to hold its place as one of the most beneficial operations in surgery, it must continue to be done with a very small mortality, which will be effected only by observing every care in detail before, at the time of, and subsequent to, the operation. [Robson's recommendation as to the advisable procedure in a case of acute dilation of the stomach is worthy of careful consideration. That acute dilation may occur in a person who has pyloric obstruction is illustrated by a recent case under the charge of one of us (DaCosta) in the Jefferson Hospital. The patient, a woman, 42 years of age, was brought into the

hospital with a history of prolonged gastric disturbance and violent vomiting for several days, followed by collapse. The abdomen was opened, and it was found that profuse hemorrhage had occurred from a vessel

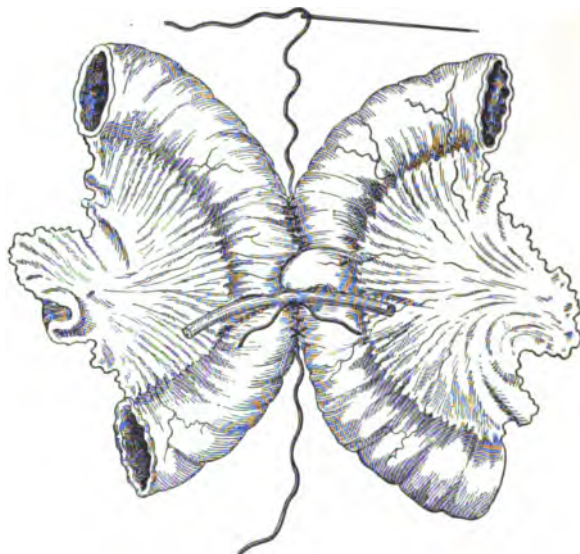


Fig. 14.—Gastrojejunostomy with the McGraw elastic ligature. The ligature tied (Walker, in Jour. Am. Med. Assoc., Jan. 17, 1903).



Fig. 15.—Gastrojejunostomy with the McGraw elastic ligature. Operation completed (Walker, in Jour. Am. Med. Assoc., Jan. 17, 1903).

of the gastrocolic omentum. A tear existed in this structure as large as a 25-cent piece. The stomach was enormously dilated and a cicatricial stenosis of the pylorus was readily detectable. The bleeding vessel was

ligated, the tear was sutured, pyloroplasty was performed, and the patient made an uninterrupted recovery. It is interesting to note that there was no history of traumatism in this case, and the inference is that vomiting caused the rupture and hemorrhage.]

H. O. Walker¹ discusses the cases of 3 women who suffered from **gastroptosis** and on whom he performed **gastrojejunostomy** with the **McGraw elastic ligature**. In each case the result was satisfactory. He is a strong advocate of this method in making lateral anastomoses of the alimentary tract. The illustrations accompanying the article show the method of applying the ligature (Figs. 11-15). Its advantages are the following: "(1) Its simplicity, which is far greater than any other yet presented. (2) Ease and rapidity with which it can be done. (3) Less liability to sepsis than by any other method. No danger of a foreign body. (5) A larger opening can be made without liability to cicatricial contraction."

Dalziel, of Glasgow,² reports 30 cases of **gastroenterostomy for non-malignant affections of the stomach** with but one death. The patients had all suffered for many years from intractable dyspepsia, and many of them presented evidences of marked pyloric obstruction. They had been under treatment prior to operation for periods varying from 2 to 17 years. In 16 of them there was a definite history of ulceration. In 18 of these cases there was well-marked contraction of the pyloric orifice. Many of the cases presented marked perigastric adhesions. The patient who died after operation was one in whom a large area of the posterior wall of the stomach had been destroyed by ulceration, the body of the pancreas forming the base of the ulcer.

Samuel Lloyd³ presents his personal experience with the **McGraw method of gastroenterostomy**. He was much pleased with the method in each case.

Hall⁴ describes the difficulties and disadvantages of both the anterior and posterior methods of performing **gastrojejunostomy** and reports 4 cases in which he has anastomosed the jejunum and the stomach through an opening made in the gastrocolic omentum. He believes that this method does away with the usual objections to both the anterior and posterior operations.

George R. Fowler⁵ discusses at considerable length the literature relating to "**vicious circle**" following **gastroenterostomy**, and describes a new operation which he has devised to prevent the occurrence of this condition. The author thinks that the term "**vicious circle**" has been too extensively used, and that if employed at all it should be restricted to those cases in which the stomach-contents pass into the afferent or duodenal side of the loop of intestine forming the **gastroenterostomy**, and are subsequently returned to the stomach mixed with the secretions from the duodenum, these including bile and pancreatic juice. In the remaining cases of persistent vomiting the term "**reflux**"

¹ Jour. Am. Med. Assoc., Jan. 17, 1903.

² Lancet, Aug. 23, 1902.

⁴ Lancet, Sept. 6, 1902.

³ N. Y. Med. Jour., Dec. 27, 1902.

⁵ Ann. of Surg., Nov., 1902.

is thought to be more applicable. After describing and comparing the various methods which have been devised for performing gastroenterostomy he states that the conditions most to be feared, next to collapse during or immediately following the operation, are the occurrence of, first, the vicious circle; second, distention of the duodenum from forcible propulsion of the stomach-contents directly into the afferent portion of the intestinal loop employed; and, third, reflux of the jejunal contents. In order to prevent vomiting as an effect of the anesthetic taking place, the operation should be done, whenever possible, under infiltration cocaineization. In order to prevent establishment of what is called the vicious circle the clear indication is to prevent any communication between the stomach and the afferent loop, and at the same time permit

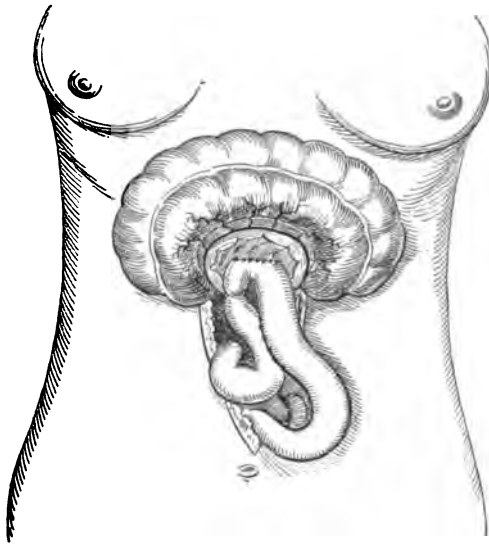


Fig. 16.—Fowler's method of gastroenterostomy (Ann. of Surg., Nov., 1902).

of the escape of the biliary and pancreatic secretions from the duodenum, and preserve them for the purposes of effecting digestion. "Enteroenterostomy, by one or another of the methods devised, is a rational resource. Of these methods, that of making the anastomosis between a loop of the jejunum and the stomach, and subsequently establishing a communication between the afferent and the efferent portions of the loop, is the simplest and at first glance ideal. This procedure alone does not, however, prevent the passage of food from the stomach into the afferent loop, nor

make ample provision for its escape after it has become lodged therein, particularly if the orifice at this point is only sufficiently large to permit of the escape of the secretions from the duodenum." The indications arising from the vicious circle, as well as overfilling of the duodenum and consequent motor insufficiency, can only be met by absolutely cutting off all communication between the stomach and the afferent portion of the loop. The method which Fowler describes consists in first securing a communication between a loop of the jejunum and the stomach, then performing an enteroenterostomy between the afferent and efferent loops, and, finally, obliterating the lumen of the afferent loop between the two points of anastomosis. The obliteration of the afferent loop is accomplished by constricting it by two or three turns of No. 20 silver wire, the cut ends of the wire being so placed as to avoid irritation of the neighboring viscera. The accompanying illustration shows the

appearance of the parts at the completion of this portion of the operation (Fig. 16). The application of a ligature to the small intestine for the purpose of occluding its lumen is not new, but was first suggested to Fowler by Dawbarn's work on the cadaver, and was first practised by him in operating for the cure of fecal fistula of the large bowel in which an ileosigmoid anastomosis was done. In this case Fowler constricted the ileum so that none of its contents passed into the cecum. This put the large bowel at absolute rest and resulted in healing of the fistula. The constriction was later removed and the small intestine was found not to have been injured at all. The operation described by Fowler has been employed by him in 6 cases with no bad results due to the constriction of the bowel by the silver wire ligature.

A. E. Barker¹ discusses **10 consecutive operations performed for nonmalignant disease of the stomach** during the past year. These cases include all Barker has operated upon for nonmalignant disease during this period. Seven of the 10 cases were cases of pyloric stenosis due to ulcer. One was a duodenal ulcer with severe hemorrhage; another was hourglass contraction, and the third a bleeding gastric ulcer. In every case posterior gastroenterostomy was performed and all of the patients recovered, and the change in health in those who have had time to show it is most remarkable. One of the marked changes noted in every case is the increase in weight after operation. In almost all of these cases there had been careful medical treatment before the question of surgical interference was entertained. Barker lays particular stress upon the necessity for carefully preparing the patient before operation. His preparation consists not only in gastric lavage, but also in rendering the mouth as aseptic as possible by the removal of carious teeth, the use of mouth-washes, etc. He also administers 10 grains of carbonate of bismuth 3 times a day during the several days immediately preceding operation. It is an intestinal antiseptic. He also washes out the lower bowel once a day for several days previous to operation. The operation in each case was done without the use of any mechanical device. The operation is that which Barker used in his first cases 15 years ago, and is accomplished by uniting the serous and muscular coats behind the proposed opening, before the latter is made, and then by opening the gut and stomach and uniting the resulting edges and finishing the continuous suture over the front which had been begun before the viscera were opened. If the patient shows any sign of shock upon the operating table a pint of saccharosaline solution is injected into the areolar tissue. Immediately after the operation the patient is placed upon his back, but as soon as he wishes it, usually on the second day, he is kept in a semi-recumbent position while awake and laid on his right side for sleep or change of position. A point worthy of note is that all of these patients were fed at first by the mouth as well as by the rectum, and in almost every case the stomach was washed out during the first 24 hours after operation with the idea of relieving the organ of bile, blood, and mucus, which are usually present and may decompose if allowed to remain.

¹ Lancet, Aug. 23, 1902.

Henri Hartmann,¹ deals with the **surgical treatment of nonmalignant diseases of the stomach** based upon 60 operations for this condition. Of these 60 patients, 10 died, making a mortality of 16.5 %. The operations are divided into two periods. The first includes all cases between 1895 and 1899. In this group the mortality rate was 26 %. The second includes all cases between 1900 and 1902. The mortality rate in this group was 10.5 %. In Hartmann's table 6 operations for perforated gastric ulcer are not included. Another division is also made in these cases—a division which is striking. Hartmann places those referred to him by physicians well informed in diseases of the stomach in one group, and those sent by other physicians generally late in the disease, in a different group. Of the former series of 36 cases, but one ended fatally; and in the second series of 26 cases, 9 were fatal. These facts go to show that the mortality in operations for nonmalignant disease of the stomach depends almost entirely upon the physician and the early diagnosis. Under the term "pyloric syndrome" the author includes pain and dyspeptic troubles arising 3 or 4 hours after meals without arrest of food and without hypersecretion of gastric juice. The results obtained in these cases are given in detail and are remarkably satisfactory. Regarding the indications for operation, Hartmann states that he does not accept the opinion of surgeons who say that operation is to be resorted to in every case of intractable dyspepsia. Atonic dilation is rarely an indication for surgical interference. Out of the 60 cases reported, there was but one such case. In pyloric stenosis operative treatment is indicated as soon as the diagnosis is made. Were it not that operation has so frequently to be performed upon patients weakened by too long waiting, the operative mortality would be reduced to nearly nothing. The acute ulcer without complications is practically always cured by medical treatment. Surgical treatment is indicated in chronic ulcer when mechanical troubles present themselves and when the ulcer is situated at the pylorus and causes the pyloric syndrome. Delay is useless in such cases of chronic ulcer, since even if the ulcer heals it will be followed by fibrous stricture. It is thought that hypersecretion or hyperacidity associated with pyloric syndrome is an indication for operation. Because of the high operative mortality, Hartmann does not think that profuse hematemesis requires operation, but surgical treatment is certainly indicated in small and repeated hemorrhages. Regarding the best operation Hartmann states that he performs gastrectomy only in those cases in which he fears an epithelial grafting; there were 4 such in his present series of cases. The indications for pyloroplasty are very limited. Gastroenterostomy is the best operation in nonmalignant disease of the stomach.

In a comprehensive paper read before the American Surgical Association Moynihan,² of Leeds, discusses the **surgery of the simple diseases of the stomach**. The subject is divided into four parts: (1) perforation of gastric or duodenal ulcers; (2) hemorrhage from gastric or duodenal ulcers; (3) chronic ulcer, its various clinical types; and (4) hourglass stomach. "The perforation of the gastric or duodenal ulcer is one of the

¹ Med. News, March 14, 1903.

² Boston M. and S. Jour., June 4, 1903.

most serious and most overwhelming catastrophes that can befall a human being." In addition to acute and chronic perforation, Moynihan describes a subacute form of perforation in which the ulcer gives way almost as quickly as in the acute form, but, owing to its small size, or to the emptiness of the stomach, or to the instant plugging of the opening, the escape of fluid from the stomach is small in quantity and the damage inflicted is considerably less than is inflicted by acute perforation. In the subacute form he has found that there is always a complaint of great discomfort for several days preceding the rupture. Chronic perforation occurs more frequently on the posterior surface of the stomach, and the perigastric abscess resulting is termed subphrenic. The acute and subacute forms of perforation are more common on the anterior surface. Moynihan admits the possibility of a recovery even after acute or subacute perforation, but the likelihood of its occurring is so remote as to render imperative the opening of the abdomen at the earliest possible moment. "The risk of operation is definite, the hazard of delay is immeasurable." The administration of morphin after a gastric perforation does much to obscure the symptoms, but attention is called to the fact that although the patient may be comfortable and complain of little or no pain there remains a continued hardness and rigidity of the abdominal muscles. In any uncertain case Moynihan would incline to operation rather than to indefinite postponement to solve the diagnosis. A set of symptoms closely resembling those of perforation are occasionally presented at the commencement of a menstrual period. From some unexplained cause a sharp attack of abdominal pain followed by vomiting, distention, prostration, and collapse may accompany the commencement of menstruation. It did so in 3 cases with which Moynihan is acquainted, and in which a negative exploration was performed. The knowledge of these cases enabled him to avoid a similar mistake in another instance. The operation for perforation should be conducted speedily and all possible precautions taken against shock. The excision of the ulcer is unnecessary; it should be inverted by two rows of sutures. If the peritoneal cavity is much soiled, free flushing is necessary; but if the operation is done within 10 or 12 hours, gentle wiping of the surrounding area with wet swabs will suffice. Drainage, as a rule, is unnecessary except in late cases, but when adopted it should be free, and if necessary a suprapubic opening should be made. Emphasis is laid upon the fact that perforating ulcers are often multiple, and therefore after suturing one ulcer others should be carefully looked for. Double perforation occurs in no less than 20 % of the cases; in the majority the second ulcer is on the posterior surface at a point exactly opposite the one on the anterior surface. In duodenal ulcer closure may result in so much constriction of the gut that gastroenterostomy may be required.

Hemorrhage is discussed under two heads; that from an acute ulcer, and that from a chronic ulcer. The characteristics of hemorrhage from an acute gastric ulcer are spontaneity, abruptness of onset, the rapid loss of a large quantity of blood, marked tendency to spontaneous cessation, infrequency of a repetition of the hemorrhage in anything but trivial

quantity, and the transience of the resulting anemia. Hemorrhage from a chronic ulcer is divided into 4 groups as follows: (1) The hemorrhage is latent or concealed, is always trivial. (2) The hemorrhage is intermittent, but in moderate quantity, occurring spontaneously and with apparent caprice at infrequent intervals. The life of the patient is never in jeopardy from loss of blood, although anemia is a persisting symptom. (3) The hemorrhage occurs generally, but not always, after a warning exacerbation of chronic symptoms. It is rapidly repeated, is always abundant, its persistence and excess cause grave peril, and will, if unchecked, be the determining cause of the patient's death. (4) The hemorrhage is instant, overwhelming, and lethal. The treatment of hemorrhage from an acute ulcer in almost every instance should be medical, but there are a few cases in which the hemorrhage may be both copious and recurrent and may threaten the life of the patient, and under such circumstances operation is necessary. Moynihan is strong in his statement that the best operation for the control of hemorrhage is gastroenterostomy, and he states that it is "futile, harmful, and quite unnecessary" to search for the bleeding point. It is in the third class of hemorrhage from chronic ulcer that operation will most frequently be necessary. In this class the base of the ulcer is, as a rule, densely hard, and the vessel traversing it is like a rigid pipe. In these cases bleeding is frequently arrested by the plugging of the vessel by a thrombus, but recurrent bleeding is apt to occur. Moynihan believes that the recurrence of the bleeding is a result of gastric dilation. It is probable, therefore, by preventing this dilation of the stomach, that gastroenterostomy accomplishes the cure. In these cases also a prolonged search for the ulcer is injudicious. The only case of operation for this condition which Moynihan has lost was one in which he did not do gastroenterostomy but only excised the ulcer. In but two instances has he excised the ulcer; in one instance the jejunum was anastomosed at the site of excision, and in the second case, the one already referred to, the ulcer was alone excised and the patient died. In all cases of severe hemorrhage from a chronic ulcer operation ought to be performed at the earliest possible moment.

In dealing with **chronic ulcer** Moynihan states that the induration which a persisting ulceration may cause is remarkable both in its extent and for its accurate mimicry of the appearances of malignant disease, and that he has no doubt that many patients who have died from supposed malignant disease of the stomach have suffered from nothing but chronic ulceration. Frequently it is difficult to tell a mass of chronic inflammatory tissue from malignant disease. The perfect smoothness of the surface over the inflammatory mass as compared with the nodular, rough, and irregular surface of the malignant mass is of great value. Moynihan is inclined to believe that Hauser's estimate of the frequency with which carcinoma develops upon a gastric ulcer (6 %) is too high; in his own experience he has only seen one case. Dyspepsia of an intractable, constantly recurring form is more often a matter of physics than chemistry. When such cases are operated upon, nearly always there will

be found some mechanical deviation from the normal. Again, attention is called to the frequency with which two ulcers are found. The indications for operation in chronic ulcer of the stomach are of widely different character. When the ulcer is near the pylorus, a dilated stomach will probably be the chief clinical sign; when the ulcer is in the body, an hourglass stomach may be caused; when the ulcer is nearer the cardiac end, gastralgia and dyspepsia may be the only indications. The author believes that there is no operation in surgery which gives better results and which gives more complete satisfaction to both the patient and the surgeon than gastroenterostomy for chronic ulceration of the stomach. The operation of gastroenterostomy is the one which is used in all cases of chronic ulcer regardless of its position. That it will relieve the symptoms completely and permanently and will permit of the sound healing of the ulcer, statistics plainly show. Excision is unnecessary, often impossible, always insufficient. The operation of pyloroplasty is not recommended. The operation which is recommended is posterior gastroenterostomy made by simple suture, the gastric and intestinal contents being controlled by Doyen forceps. The time required for this operation is usually about 30 minutes, although Moynihan has performed it in 17. The various steps of the operation are minutely described, and closely resemble those already detailed by Barker. Moynihan uses for his suture material Pagenstecher thread. He does not suture the mesocolon to the stomach. When the patient is returned to bed, his shoulders and head are supported by 3 or 4 pillows. Nutrient enemas are given every 4 hours and the bowel washed out every morning with a pint of hot water. No fluid is given by the mouth for 12 hours, or until the ether sickness is over, and then in very small quantities frequently repeated. At the end of 48 hours milk, puddings, soups, and so on are given.

In discussing **hourglass stomach** the surgeon is reminded of the possibility of the stomach being divided into 3 instead of 2 pouches. In one instance Moynihan found an hourglass duodenum as well as an hourglass stomach. Although acknowledging that there is no inherent improbability in the existence of congenital hourglass stomach, it is stated that the condition lacks proof. The condition may be produced by: (1) perigastric adhesions; (2) ulcer, with local perforation and anchoring to the anterior abdominal wall; (3) chronic ulcer generally at or near the middle of the organ; (4) malignant disease. All of the symptoms of hourglass stomach are carefully described, but the two most to be depended upon are gastric lavage and the distention with gas by administering a Seidlitz powder in two portions. When the stomach is washed out with a known quantity of water, the loss of a certain quantity will be observed when the return fluid is measured. Again, if the stomach be washed out until the fluid returns clear, a strong rush of foul and evil-smelling fluid may occur; or if after washing the stomach clean the tube is withdrawn and passed again in a few minutes, several ounces of dirty, offensive fluid may emerge. When the cardiac portion is small, the symptoms may closely resemble those of obstruction of the lower portion of the esophagus. A correct diagnosis can be made by introducing the esophageal

bougie; if the bougie passes over 16 inches from the teeth the obstruction probably lies in the stomach. Regarding the treatment of this condition the surgeon must be very careful when the abdomen is opened to examine all parts of the stomach up to the cardiac orifice. In many cases of hourglass stomach no single operation will suffice to relieve the symptoms. This is due to the fact that when a stricture is present in the body of the stomach, a second one near the pylorus may also be found. The following operations may be performed for hourglass stomach, and the choice will necessarily depend upon the condition which is found: (1) gastropasty; (2) gastrogastrostomy or gastroanastomosis; (3) either of the foregoing, with gastroenterostomy from the pyloric pouch, in cases of dual stenosis; (4) gastroenterostomy from cardiac pouch, when the pyloric pouch is so small that it can be ignored; (5) gastroenterostomy from both pouches; and (6) partial gastrectomy. These remarks of Moynihan are based upon the following operations: Perforating gastric or duodenal ulcer, 12 cases, 6 recoveries; gastroenterostomy for chronic ulcer, etc., 70 cases, 1 death; pyloroplasty, 3 cases, 0 deaths; hourglass stomach, 15 cases, 3 deaths; gastroplication, 1 case, recovered; excision of ulcer for hematemesis, 1 case, died.

Kellock¹ presents a very interesting report of a case of **excision of a chronic gastric ulcer** in a woman 36 years of age. The ulcer was situated in the posterior wall of the stomach near the cardiac extremity of the lesser curvature. The case is interesting in that it showed an elongated band attaching the site of the ulcer to the lesser omentum. The band was divided and the ulcer, with an indurated portion of the stomach-wall, excised. The wound was closed with 3 layers of sutures, one in the mucous membrane, one in the muscular wall, and a third in the serous coat. The patient was fed by the rectum for 7 days, and made an uneventful recovery. The final outcome of the case was most satisfactory. It is thought that the band had been produced from an adhesion, the result of a former attempt of the ulcer to perforate.

Moullin² strongly advocates **operative treatment in cases of chronic ulceration of the stomach**. When an ulcer once becomes chronic, a cure, in the full sense of the word, is seldom attained by medical treatment. The longer the ulcer remains unhealed, the less likely becomes the chance of healing and the greater becomes the liability to complications. The operation, when performed before complications have set in, should present no higher mortality than interval operations for appendicitis. The conditions which prevent the healing of a chronic ulcer are entirely local. Moullin has operated upon 5 uncomplicated cases, 3 by excision, and 2 by ligature of the whole thickness of the stomach, and repair was rapid and complete in each. Persistent irritation of the surface of the sore and the dense, almost cartilaginous, infiltration of the base and edges prevent a chronic ulcer from healing. Some of the consequences of chronic ulcer of the stomach are perforation, subphrenic and perigastric adhesions, hourglass contraction of the stomach, pyloric stenosis, and hemorrhage. All of these complications can be prevented

¹ Lancet, July 12, 1902.

² Lancet, Dec. 27, 1902.

by a timely operation. The ulcer may be excised or ligated, according to its depth and extent. Difficulty in operating occurs only when the ulceration has reached such a size or depth or has caused such dense adhesions that simple excision or ligature is not longer practicable.

Moullin¹ presents the question of **gastrotomy for recent gastric ulcer**, and reports 3 late cases. In addition to these cases, Moullin published in the *Lancet*² 3 other cases, in which he operated for hematemesis, and all of which recovered. Of the present cases, 2 patients were operated upon for hematemesis, one of whom recovered, and the other, who was very much exhausted at the time of operation, died. Three of these 5 patients had lost so much blood that transfusion was necessary at the time of operation. Attention is called to the mistake of comparing the mortality-rate of all cases of hematemesis which are not operated upon with that of those severe cases in which operation is performed. In the first class are included a large number of slight cases in which no surgical treatment would be thought of. The only way to compare the results of the two treatments is to take those cases in which surgical treatment is recommended and declined, and compare the mortality of those with that of those in which the operation is accepted. A study of 246 cases of hematemesis from gastric ulcer occurring in the London Hospital in the 5 years from 1895 to 1899 inclusive, shows that the condition is much more apt to be fatal in patients over 30 years of age. In women under 30 hematemesis rarely requires surgical treatment. The author considers operation indicated when there is a single severe hemorrhage occurring in a case of gastric ulcer; when there is a second separate attack of severe hematemesis after a short interval; and when there are frequent small hemorrhages which render the patient sore and more anemic. Any case of gastric ulcer in which medical treatment is accomplishing nothing, in which vomiting obstinately persists, and in which the patient is losing ground, should also be submitted to operation.

An interesting case of **chronic ulceration of the stomach complicated by a hair-ball** was reported by Mallins.³ The patient was a woman aged 22. She had suffered from attacks of nausea and pain for 2 years. Shortly before admission to the hospital she vomited a quantity of blood. She was extremely emaciated and anemic. On admission the chief complaint was of pain in the left side just below the ribs. A large tumor of somewhat rounded outline was easily felt. It extended from the tip of the ensiform to the transverse line, running 2 inches below the umbilicus. The tumor was firm on pressure and quite free from tenderness, with the exception of one point. It could be easily moved about. No pain was complained of except after taking food. It was thought that the tumor was either a retroperitoneal sarcoma, a pancreatic cyst, or was made up of enlarged tuberculous glands. Because of the extremely feeble state of the patient's circulation operation was considered to be contraindicated. At the necropsy the mass proved to be in the stomach and to consist of a black hair-ball weighing 1 pound and 9

¹ *Lancet*, July 5, 1902.

³ *Lancet*, June 6, 1903.

² *Lancet*, Oct. 10, 1900.

ounces, reaching from the cardiac end through the dilated pylorus into the duodenum. It completely filled the stomach cavity. Several large chronic ulcers were found in the stomach wall, one measuring $3\frac{1}{2}$ by 2 inches. A smaller ulcer had perforated the gastric wall and its floor was formed by the adherent pancreas. Several healed ulcers were also found. The case teaches that in tumors of the gastric region the possibility of hair-ball distention should not be overlooked, and that in all cases when the patient's strength is equal to it an exploratory operation should be made.

E. Cautley and Clinton Dent¹ discuss interestingly the subject of **congenital hypertrophic stenosis of the pylorus** and urge the operation of pyloroplasty as the most beneficial for this condition. Two cases are reported in which Dent performed this operation with satisfactory results. The authors have been able to collect reports of over 50 cases, and in 19 of these operation was performed. Infants affected with this condition, if untreated, die in about 3 or 4 months. The symptoms in the two cases operated upon were quite typical, and consisted in persistent vomiting, dilation of the stomach with visible peristalsis, and constipation. The symptoms developed when the children were but a few weeks old. Persistent vomiting and constipation are not sufficient to make a diagnosis, but when these are accompanied by dilation of the stomach and visible peristalsis, and are themselves persistent, a diagnosis of hypertrophic stenosis of the pylorus should be seriously considered. The first case operated upon by Dent made an excellent recovery; the second showed great improvement, but died several months later from zymotic enteritis. Of the 19 reported cases of operation for this condition pylorotomy was performed once; gastroenterostomy 9 times; dilation of the pylorus 6 times, and pyloroplasty 3 times. Gastroenterostomy has been the favorite operation, though the authors maintain that pyloroplasty is much to be preferred, and also state that dilation of the pylorus is preferable to gastroenterostomy. Pyloroplasty permits the removal of the longitudinal fold of mucous membrane which is so often found in these cases. Pyloroplasty is simpler and can be more quickly performed than gastroenterostomy.

Robert Jones² reports 4 cases in which he operated for **perforating gastric ulcer**, 3 of which terminated in recovery. The first patient, who had quite a typical case, was operated upon 3 hours after the onset of acute symptoms. The ulcer was situated on the anterior surface of the stomach and was easily inverted. The abdominal cavity was irrigated and closed without drainage. The patient made a perfectly satisfactory recovery. The second case was a very difficult one, due to adhesions between the stomach and the abdominal wall and the liver. The perforation would admit a small finger. There was so much inflammation around the ulcer that it was closed with great difficulty. The general cavity was shut off by adhesions, and therefore only the field of operation was irrigated and drained. On the fourteenth day after operation the patient developed a cough and expectorated a quantity of foul-smelling

¹ Lancet, Dec. 20, 1902.

² Brit. Med. Jour., Nov. 29, 1902.

pus. A few hours later, the patient's condition having become worse, she was anesthetized and the former seat of operation explored, but there was no collection of pus. Only clear fluid could be drawn from the thorax. In the left hypochondrium pus was found and evacuated by a free incision. The patient died soon after the second operation. At the necropsy it was found that the left lung was firmly fixed to the diaphragm and a small hole was seen entering the lung tissue, perforating the diaphragm and discharging foul-smelling pus. The third and fourth patients were operated upon one 14 and the other 9 hours after perforation, and both recovered.

Three cases of **perforated gastric ulcer** are reported by Althorp.¹ In the first and second cases the perforations were in hourglass stomachs. In the first case, owing to the position of the perforation, and adhesions which had formed, it was impossible to close the opening with sutures. As the general peritoneal cavity was shut off by adhesions, it was determined to drain the inflamed area with gauze packing. The patient did well until the tenth day, when she began to cough and expectorated a quantity of offensive pus. Consolidation occurred at the base of the left lung, and an exploring needle introduced into this area reached pus. The patient died, and at the necropsy an opening in the diaphragm was found opposite the opening in the stomach, and at this point the lung was adherent and near the base was a small abscess. [This case closely resembles in every respect the one reported by Jones.] The second case recovered after operation, although she developed subsequently an abscess in the left flank, probably the result of ineffectual washing of the left kidney pouch at the time of the operation. No drainage was employed in this case. In the third case the perforation was in the posterior wall of the stomach. The pelvis and right kidney pouch were full of turbid stomach-contents, and after thorough irrigation the pelvic cavity was drained through a suprapubic opening. The operation in this case was performed 8 hours after perforation and the patient recovered. The first case reported, the fatal one, was operated upon 32 hours after perforation.

Perforating gastric and duodenal ulcers are dealt with at considerable length by A. A. Berg,² who reports 4 cases with operation, 2 of which terminated in recovery. In perforating posterior ulcers of the duodenum it is recommended that the retroduodenal, retrocolic, and perinephric spaces should be drained through a lumbar incision and the orifice of the ruptured ulcer tamponed with gauze. The abdomen should then be opened, gastrojejunostomy be performed, and the pylorus constricted with a purse-string suture. This method will exclude the duodenum from the intestinal circuit and cause the ulcer to close. It is believed that this procedure is better than jejunostomy. The author has not performed the operation.

Bailey³ reports 3 cases of **perforating gastric ulcer presenting atypic symptoms**. These patients were in the West London Hospital

¹ Lancet, May 30, 1903.

² Med. Rec., June 6, 1903.

³ Lancet, April 18, 1903.

under the care of a number of different men. A remarkable feature of the first case was that although a gastric ulcer had been diagnosed prior to perforation, when the latter event took place the patient became markedly collapsed but suffered absolutely no pain in the abdomen. An enema given at this time was returned with a large melanic movement; there was no vomiting, no rigidity, and no pain. It was supposed that the collapse was due to hemorrhage from a duodenal ulcer. No operation was performed. At the necropsy a perforation the size of a half-crown was found on the posterior wall of the stomach and the lesser peritoneal cavity was filled with blood. The foramen of Winslow was occluded and therefore there was no blood or gas in the general peritoneal cavity. The patient died 12 hours after the onset of acute symptoms. The second case reported is interesting as showing (1) that in a condition of acute septic peritonitis there may be practically a normal pulse and temperature, and also that vomiting and abdominal tenderness are not necessary symptoms of this condition; (2) that collapse does not always accompany perforation, for perforation in all probability must have occurred 9 days before death and immediately before the physician met the patient running to consult him; and (3) that a peptic ulcer on the point of perforating caused no digestive or abdominal symptoms whatever. With regard to the third case, here also collapse did not follow perforation, for the temperature half an hour after perforation had risen to 100.2°. The change in the aspect of the patient was the most valuable indication of perforation. The presence of melena without hematemesis or vomiting was evidently due to the hemorrhage occurring on the pyloric side of the constriction produced by the ulcer. In none of the 3 cases was there obliteration of the liver dulness.

A case of **recovery after operation for perforating gastric ulcer** is reported by Fraser.¹ An interesting point in this case is the fact that the patient had two sisters suffering from gastric ulcer and a third who had died from what was apparently the same condition. The patient was operated upon 6 hours after the perforation.

Five cases of **perforated gastric ulcer treated by operation** are reported by George Heaton,² who presents a brief discussion of the subject. The first case was one of chronic perforation with the formation of a perigastric abscess. The abscess cavity was freely opened and drained and the patient recovered. The second case was one of perforation of an old gastric ulcer on the anterior surface of the stomach. The abdomen was opened 37 hours after the onset of symptoms and the ulcer closed. The patient died on the twentieth day from right-sided empyema and liver abscess. The third case was one of perforation of a gastric ulcer followed by subsidence of symptoms for 3 weeks, which in turn was followed by a sudden onset of acute general peritonitis. The abdomen was opened and an abscess found between the liver and stomach. A small perforation was seen on the anterior surface of the stomach, apparently closed by recent adhesions, which fixed the organ to the costal arch on the left side. This was closed and the abscess cavity

¹ Brit. Med. Jour., Feb. 21, 1903.

² Brit. Med. Jour., July 12, 1902.

was wiped out and drained. The peritonitis rapidly extended after operation and the patient died 4 days later. Heaton states that he was probably in error in this case in not operating when the first perforation took place, but when he saw the patient all signs of collapse had disappeared and she appeared to be so well and so free from pain that he doubted if it was justifiable to even explore to see if a perforation had actually occurred. The fourth case was quite a typical one occurring in a young girl. The operation was performed 27 hours after the perforation. The perforation occurred on the anterior surface close to the pylorus. Irrigation was not employed in this case, but the cavity was sponged dry and drained. The patient recovered. The fifth case was a typical one so far as symptoms went, and operation was performed 4½ hours after their onset. The perforation was on the anterior surface of the stomach; irrigation was not employed, but the abdomen was carefully cleansed with sponges and the left hypochondrium drained. The patient died on the fifth day after operation from general peritonitis. Heaton has collected all the cases operated upon for perforated gastric ulcer in several large London and provincial hospitals during the last 5 years, including only those where upon operation an actual perforation was seen and sutured. Forty cases have thus been collected with 14 recoveries and 26 deaths.

C. F. Barber¹ reports an interesting case of **multiple ulcers of the stomach** in a boy of 10 years. The patient died from perforation without operation, Barber seeing him but 2 hours before death took place. At the autopsy 4 ulcerated patches were found, 2 of which had perforated. The symptoms of perforation were very obscure and were much aggravated by the administration of a purgative by the boy's mother.

In reporting a number of operations for **gastric ulcer, acute and chronic**, Rushton Parker² reports 5 cases of perforation with 4 recoveries. In one of these cases perforation took place at the point of constriction in an hourglass stomach. He also reports 4 cases of operation for chronic perforation, 2 of which ended in recovery and 2 of which were fatal.

F. Gregory Connell³ deals extensively with **gastrointestinal perforations and their diagnosis**, devoting considerable space to the history and to the quotation of authorities. His conclusions are as follows: "(1) The previous attempts at an early and accurate diagnosis of perforation of the gastrointestinal tract without opening the abdominal wall have not been adopted. (2) There has been practically no improvement in the method of diagnosing such conditions during the past century. (3) The treatment of the perforation *per se* during the last century has progressed to a state bordering on perfection when compared with the older methods. (4) The diagnosis of gastrointestinal perforations is one of the most important unsolved questions in the domain of abdominal surgery. (5) There is no pathognomonic sign or symptom or group of signs or symptoms of perforation. (6) The only positive method of arriving at a diagnosis to-day is to either perform an exploratory laparotomy or await

¹ Brooklyn Med. Jour., Dec., 1902.

² Brit. Med. Jour., Nov. 29, 1902.

³ Jour. Am. Med. Assoc., March 28, 1903.

the development of a peritonitis. (7) To await the development of a peritonitis will reveal the diagnosis too late for the most effectual treatment. (8) Exploratory laparotomy as a routine measure will of necessity result in some cases being needlessly exposed to the many dangers of a major operation. (9) Exploratory laparotomy is not a harmless procedure. (10) The consensus of opinion is in favor of exploratory laparotomy as a choice between two evils. (11) The fact that even the most expert clinicians fail to diagnose perforation in all cases and even diagnose such a condition when it does not exist shows the great need of improvement in diagnostic methods. (12) The diagnosis should be arrived at before the treatment of the perforation is complicated by the presence of a peritonitis. (13) The injection of air or normal salt solution into the peritoneal cavity and withdrawal of the same for examination will do no harm. (14) Such a procedure will, in many instances, reveal a perforation before any sign or symptom of peritonitis exists. (15) The treatment of the perforation *per se* is simple and satisfactory. (16) The treatment of the complicating peritonitis is multiple and unsatisfactory. The best treatment is prophylactic, *i. e.*, early diagnosis and repair of perforation before peritonitis has become established."

John B. Murphy and J. M. Neff¹ present an exhaustive study on **perforating ulcers of the duodenum**. Weir, in a paper read before the American Surgical Association in 1900, reported all the cases of perforative duodenal ulcer up to that date, and the authors have collected from the literature of the subject between May, 1900, and July 1, 1902, 19 cases, including one operated upon by Murphy. A careful study of these cases causes the authors to reach the following conclusions: "The diagnosis of perforating duodenal ulcer is difficult, or, better, practically impossible without an exploratory laparotomy. In many cases there is no evidence of duodenal disease previous to the perforation. The most important physical sign, in addition to those of perforative peritonitis from perforations in other portions of the intestinal tract, is the flatness of the superficial, piano, percussion-note. The leukocytosis in our case, the only one in which it was given, was pronounced, showing an inflammatory condition in contradistinction to the absence of it in intestinal obstruction and fat necrosis of the pancreas. It must be borne in mind, however, that leukocytosis is not a necessary manifestation of perforation or of inflammation. It is a manifestation of the reaction of blood to infections. It is often entirely absent in typhoid perforations, as we have observed in repeated blood examinations after perforation during the present epidemic in Chicago. Collapse is absent in duodenal perforations, except where associated with severe hemorrhage. Collapse in intestinal perforation is the manifestation of the absorption of the products of infection, and not a manifestation of the perforation *per se*. Collapse is always secondary to abrasion or denudation of the endothelial covering of the peritoneum, which abrasion permits of rapid absorption. In all cases of perforative peritonitis, to which duodenal perforations are no exception, an operation should be performed at the earliest possible

¹ N. Y. Med. Jour., Sept. 20 and 27, 1902.

moment after perforation has taken place; and clinical experience shows that the mortality is in direct proportion to the length of time that elapses between the occurrence of perforation and the operation. In perforation, the longer the escaping material is in contact with the peritoneum, the greater the danger of destruction of its endothelial covering, and thus the greater the danger of absorption. Of 13 cases operated on 30 hours after perforation, all terminated fatally; while in 12 cases where less than 30 hours had elapsed, 66 $\frac{2}{3}$ % recovered (Weir). These comparisons emphasize more than words can the importance of early operation. The operation must be complete; that is, it must be pursued to an effective suture of the perforation. Drainage is insufficient, as 18 patients treated by drainage alone all died (Laspèyres). Suture of the opening can be easily accomplished, as in 98 % of the perforating ulcers the opening was in the first portion of the duodenum, its most accessible portion. Where duodenal perforation is suspected, the incision should be through the right rectus muscle. It can then be carried upward to the costal arch or downward to the symphysis pubis without dividing any of the transverse muscles. The incision through the rectus muscle is the one which we commonly make in operating for appendicitis. It can be enlarged upward or downward without interfering with the muscle. Drainage or no drainage is a matter of personal election, influenced more or less by the pathologic condition present at the time of the operation. The after-treatment is that commonly followed after abdominal section, except that the patient is kept elevated in bed at an angle of 35 degrees for the first 48 hours after the operation. The prognosis depends: First, on the virulence of the peritonitis produced; second, on the time the material has been allowed to remain in the peritoneum; third, upon the presence or absence of blistering or abrasion of the peritoneum at the time of operation."

D'Arcy Power¹ reports 4 instructive cases of **acute perforation of a duodenal ulcer**. The first case is that of a strong man 41 years of age, and is particularly interesting because the localized peritonitis must have lasted a much longer time than the sudden onset of the symptoms seems to indicate, and also because the symptoms were so obscure as to make it seem even to competent observers that the patient was suffering from pneumonia rather than acute peritonitis. Power operated upon the patient as soon as he saw him and found a perforation upon the posterior wall of the first portion of the duodenum. Because of its position it was very difficult to close the ulcer with sutures. Death occurred a few hours after operation. The second case was that of a fat, healthy-looking cabman, 47 years of age. He was seized with sudden and severe pain in the abdomen while eating his breakfast. He gave no history of previous attacks of indigestion. Perforation in this case was also in the first portion of the duodenum, behind. The abdominal cavity was sponged out and completely closed. The patient died 8 days after operation, and at the necropsy a pint of foul pus was found in the peritoneal cavity situated above the stomach and the first part of the duo-

¹ Brit. Med. Jour., Jan. 10, 1903.

denum. [This case teaches us that although a patient may be doing well rapidly of pulse should cause suspicion, and also that drainage of the abdominal cavity should always be employed.] The third case was that of a clerk 37 years of age, who gave a history of frequent attacks of stomach-ache about half an hour after taking food. On the day of admission he was suddenly seized with severe pain in the abdomen in the neighborhood of the umbilicus. The abdomen in this case, after the closure of the perforation, was drained by rubber tubes. The patient died about 20 hours after operation. In the fourth case, that of a well-nourished man 26 years of age, there was a history of previous attacks of stomach-ache. The present illness began with severe abdominal pain and nausea. The symptoms in this case were referred to the right iliac region particularly. The patient was thought to be suffering from an attack of acute appendicitis. The abdomen was consequently opened in this region. As the appendix and intestine in the neighborhood were found normal, a second incision was made in the middle line and a perforation found in the anterior surface of the first part of the duodenum. In this case the peritoneal cavity was drained by large tubes passed into the space below the liver, into the rectovesical pouch, and into both flanks. This patient was fed by the rectum for 10 days and recovered. A consideration of these cases causes Power to reach the following conclusions: "(1) Duodenal ulcers occur more often in men than in women. (2) The extravasated fluid trickles into the iliac fossas, and causes local peritonitis which may be mistaken for acute appendicitis. (3) The transparent or bile-stained succus entericus found in the peritoneal cavity is diagnostic of a perforated duodenal ulcer. It is quite different from the gastric contents escaping at a perforated ulcer of the stomach. (4) The prognosis of a duodenal ulcer is worse than that of a perforated gastric ulcer on account of the greater difficulty in closing it satisfactorily. (5) The prognosis should not be too sanguine until after the lapse of the eighth day, and it is always bad, however well the patient may appear, if the pulse-rate continues rapid. The pulse is a much better guide than the temperature. (6) Free drainage is imperative, both iliac fossas, the rectovesical pouch, and the space below the liver more particularly need tubes. It is better that the patient should recover with a scarred belly than that he should die with an abdomen full of pus. (7) The feeding of the patient is a matter of great importance. Small quantities of food should be given frequently, and if the patient feels sick the amount must be reduced at once. It is better to give nutrient enemata for some days after the operation than to administer food by the mouth." [Gibson operated recently upon a young man suffering from an acute peritonitis supposed to be due to appendicitis. When the abdomen was opened, the pelvis was filled with a flocculent fluid and the appendix and small intestine in its neighborhood were much inflamed. The appendix was removed, but seeing that it could not be the cause of so extensive a peritonitis, a further search was carried out and a perforated duodenal ulcer found. It was closed with difficulty, the abdominal cavity thoroughly irrigated and extensively drained. Although the patient's condition on the table was very bad, he recovered.]

Angus¹ reports a case of **ruptured duodenal ulcer** in a man 41 years of age, who for 10 days had had pain in the stomach after drinking bouts. The patient was a large, powerful-looking man who was admitted in a state of collapse, from which he somewhat rallied after stimulation. He complained of great pain over the epigastrium and the abdomen was tense and somewhat distended. The breathing was thoracic. The diagnosis of ruptured gastric ulcer was made and operation immediately performed. A perforated ulcer was found in the anterior surface of the first part of the duodenum. A gauze drain was placed over the seat of ulcer and a Keith's tube placed in the pelvis. The patient recovered.

The question of **uremic ulceration of the duodenum** is briefly discussed editorially in the *Lancet*.² The subject of the editorial is a case reported by Barié and Delaunay. For 2 months the patient had suffered from breathlessness and at times had had attacks of severe dyspnea. Digestion was painful and he often vomited food. The urine contained albumin and the legs were edematous. About a month after his admission to the hospital diarrhea began, and later there was an abundant entorrhagia, the mattress being soaked with blood. The next day the patient became comatose and died. In addition to the pathologic lesions of the kidneys there were found several ulcers of the duodenum, one 2 cm. from the pylorus, another a little further down, and opposite the ampulla of Vater were two smaller ulcers. Uremic ulceration of the duodenum generally takes the form of a single ulcer in the first part of the bowel. The remaining part of the alimentary canal, however, may be influenced or may present similar ulcerations. Sometimes the whole duodenum is inflamed. Duodenal ulcers occur in the most diverse renal diseases, acute and chronic parenchymatous nephritis, interstitial nephritis, renal tuberculosis, etc. The most reasonable explanation of the duodenal ulceration in these cases seems to be that defective renal secretion leads to vicarious excretion by the alimentary canal; hence, the stomatitis, dyspepsia, gastralgia, vomiting, and diarrhea of uremia. It is difficult to explain why the duodenum alone should be affected. Stasano, however, has attempted to show that the duodenum plays a special part in the excretion of poisons.

William S. Bainbridge³ discusses the subject of **duodenal abscess secondary to ulcer of the duodenum**, reporting in full a case of his own, and briefly 8 others which he has collected from literature. The case reported by Bainbridge is that of a man 54 years of age. This patient suffered from an attack that was diagnosed as acute gastritis about a month before Bainbridge saw him. The attack came on suddenly, was accompanied by intense abdominal pain, and followed immediately upon the ingestion of a glass of ginger ale. Under medical treatment the symptoms subsided, and on the sixth day the patient was able to walk about. On this day he ate 3 oranges. A few hours later vomiting began, but the patient suffered none of the severe pain of the first attack.

¹ Brit. Med. Jour., Jan. 17, 1903.

² Lancet, Feb. 14, 1903.

³ Med. News, March 7, 1903.

The stomach was given a rest of 2 weeks, rectal feeding being employed. After this time light feeding was gradually resumed. When Bainbridge saw the patient, he was in great emaciation, he seemed cachectic, and the skin and conjunctiva were slightly icteric. There was some tenderness and slight resistance in the region of the pylorus and of the hepatic flexure of the colon. The diagnosis of abscess due to a perforated duodenal ulcer or of pyloric cancer was made. The patient was in no condition for operation at this time, and an attempt to improve his condition failed. Autopsy confirmed the diagnosis of abscess due to perforated duodenal ulcer.

Henry D. Beye¹ describes an **original method for elevation of the stomach in gastropotosis by plication of the gastrohepatic and gastro-**

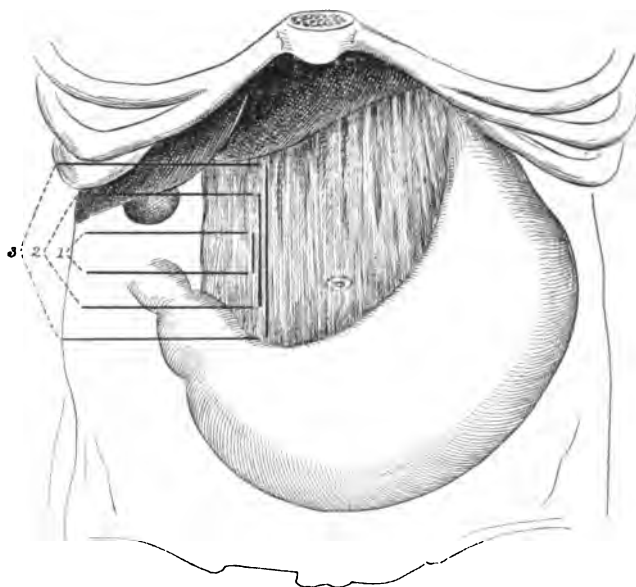


Fig. 17.—Beye's operation for gastropotosis. 1, Position of one suture of first row; 2, one suture of second row; 3, one suture of third row. Others of each row introduced at intervals to and including the gastrophrenic ligament (Phila. Med. Jour., Feb. 7, 1903).

phrenic ligaments. Beye first performed this operation on April 19, 1898, and has employed it in 4 cases. All of these patients, who had been great sufferers prior to the operation, were wonderfully benefited by it. The operation consists in a plication of the lesser omentum by applying 3 rows of sutures across it, as shown in the accompanying illustration (Fig. 17). The other operations which have been devised for the cure of gastropotosis are briefly described. The operation of Bier is much like that of Beye; so much so, in fact, that Beye in discussing his results combines with his cases 4 others operated upon by Bier. The operations of Duret and Rovsing consist in fixing the stomach to the abdominal wall. The advantage of the Beye operation is that the

¹ Phila. Med. Jour., Feb. 7, 1903.

mobility of the stomach is not interfered with, as the viscus is brought to its normal position by shortening its normal ligaments. The only difference between the Beyea and Bier operation is that in the latter the pyloric end of the stomach is attached to the capsule of the liver. In all of the cases operated upon by Beyea the symptoms were marked and the patients had been great sufferers for a number of years. In two a right nephropexy had been done, but without relief. All of the patients were emaciated, but rapidly gained flesh after the operation. The improvement in health in every case has been remarkable and the relief of symptoms complete. The patients operated upon all presented gastropotosis without relaxation of the abdominal walls or diastasis of the recti muscles. Experience alone will teach what influence the operation will have when the relaxation of the abdominal walls is active in the production of the gastropotosis.

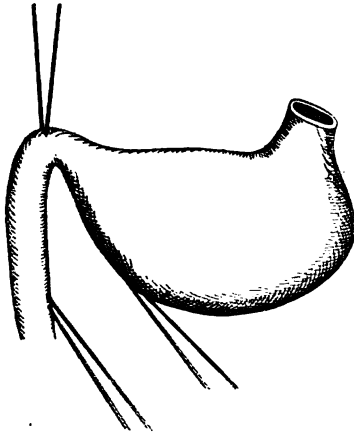


Fig. 18.—Finney's method of pyloroplasty. The retracter sutures (Bull. Johns Hopkins Hosp., July, 1902).

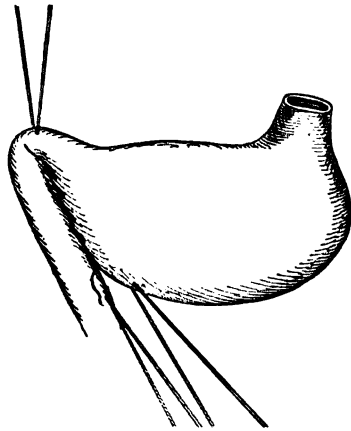


Fig. 19.—Finney's method of pyloroplasty. Suture of greater curvature of stomach to duodenum (Bull. Johns Hopkins Hosp., July, 1902).

A new operation for gastropotosis is described by Coffey,¹ who has put it to the test in 2 cases, which are minutely described. The operation consists in attaching the omentum, as it comes off from the greater curvature of the stomach, to the abdominal wall. The sutures are introduced about 1 inch from the stomach and in such a manner as to avoid the large blood-vessels. In one of the cases operated upon the lesser curvature of the stomach was almost 2 inches below the umbilicus. The omentum was stitched to the abdominal peritoneum about 1 inch above the umbilicus by means of chromicized catgut sutures. The patient in this instance had suffered a great deal prior to operation; since operation she has had practically no disturbance of digestion, is able to do her own work, and is apparently perfectly well. The result in the second case was quite as satisfactory, the same method being employed. In

¹ Phila. Med. Jour., Oct. 11, 1902.

extreme cases when the transverse colon is also very low, it is recommended that the omentum be sutured to the parietal peritoneum, both above and below the colon. Dilation of the stomach, which is almost always associated with gastropptosis, is also relieved by the operation in the majority of cases.

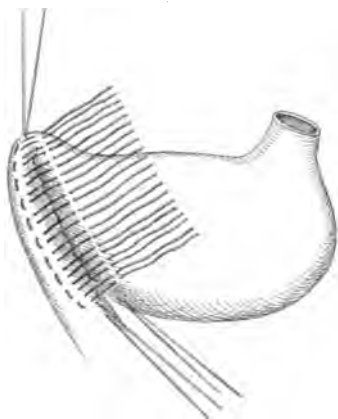


Fig. 20.—Finney's method of pyloroplasty. Shows the three retractor sutures, the posterior line of sutures tied and the anterior line of sutures untied (Bull. Johns Hopkins Hosp., July, 1902).

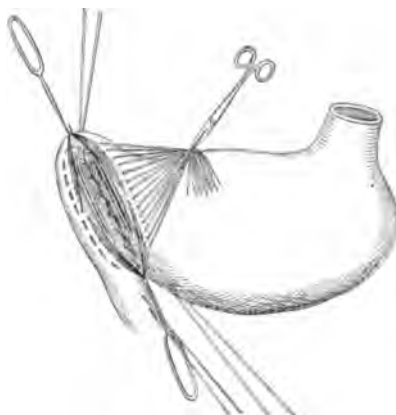


Fig. 21.—Finney's method of pyloroplasty. The anterior sutures gathered and lifted (Bull. Johns Hopkins Hosp., July, 1902).

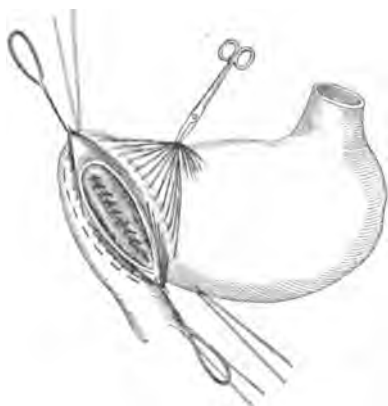


Fig. 22.—Finney's method of pyloroplasty. The continuous posterior catgut sutures (Bull. Johns Hopkins Hosp., July, 1902).

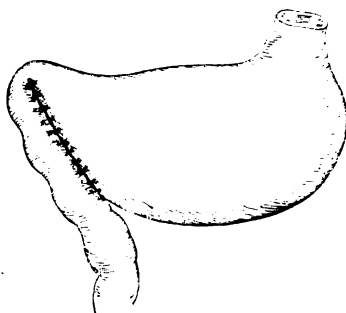


Fig. 23.—Finney's method of pyloroplasty completed by tying the anterior sutures (Bull. Johns Hopkins Hosp., July, 1902).

A new method of pyloroplasty is described by Finney,¹ who in presenting it first discusses the history of pyloroplasty and describes and compares the former methods of doing this operation. Finney has done this new operation upon 5 patients with most satisfactory results, all the patients recovering and being relieved of symptoms. The operation can readily be understood by consulting the accompanying excellent illustra-

¹ Bull. Johns Hopkins Hosp., July, 1902.

tions (Figs. 18 to 23). [This operation of Finney's has much to commend it, and we believe it will be extensively practised.]

A. H. Buck¹ reports a case of **postoperative hematemesis** occurring in a woman 53 years of age from whom he had removed both ovaries and the uterus. The vomiting occurred 4 hours after operation. The temperature fell to subnormal but the pulse was not affected. The quantity vomited on each occasion was large. A lead and opium pill was administered and on the next day, as the vomiting continued, 4 doses of liquor chlorid of adrenalin were administered hourly, the first two doses consisting of 30 minims each and the last two of 10 minims each. The patient recovered. This case would seem to corroborate the view expressed by Robson and Moynihan that postoperative hematemesis is due to reflex nervous action. It is also thought that the blood coagulability was below par in this case, as the patient had suffered from urticaria all her life. The blood condition greatly improved under treatment with calcium chlorid.

A case of **operation for acute hematemesis** is detailed by A. H. Buck.² The patient was *in extremis* as a result of repeated profuse hemorrhages. As no ulcer could be felt from the outside, the stomach was opened and an ulcer was found at the cardiac end of the posterior wall. It was brought into view with difficulty and was thought to be acute, as there was no thickening around the edges. The ulcer was excised and the aperture was closed by a purse-string suture on the peritoneal aspect and by another purse-string suture of the mucous membrane. The patient developed parotitis after the operation, but except for this made an uninterrupted recovery.

Henry M. Joy³ discusses **gastrorrhagia** and reports 2 cases on which he has operated. In each of these cases the hemorrhage came from a number of eroded areas in the mucous membrane. The stomach was opened in each case and the bleeding points were controlled by purse-string sutures. The first patient recovered, but the second died from continued hemorrhage. In the second case 13 points of bleeding were ligated. A second operation was performed in this case and 6 or 8 more bleeding points were ligated. In neither case was there any condition which might produce a mechanical congestion of the stomach. In neither case were there any symptoms indicative of ulcer prior to the hemorrhage.

Mayo Robson⁴ delivered an address on the **importance of an early diagnosis of cancer of the stomach with a view to radical treatment**. He calls attention first of all to the great improvements recently obtained by early operation in cases of gastric cancer. He states that no one has done more than Osler in advocating the early diagnosis of cancer in order that an early operation may be performed at a time when there is hope of cure. The three most important symptoms are pain, vomiting, and tumor. The latter, however, is not an early symptom. One should not wait for its development before making a diagnosis. The author relates many cases to fortify his conclusions which go to prove: "(1) How

¹ Lancet, Aug. 23, 1902.

² Med. News, Aug. 16, 1902.

³ Lancet, April 4, 1903.

⁴ Brit. Med. Jour., April 25, 1903.

desirable it is to make an early diagnosis of cancer of the stomach in order that a radical operation may be performed at the earliest possible moment. (2) That it may be needful to perform an exploratory operation in order to complete or confirm the diagnosis. (3) That such an exploration may be done with little or no risk in the early stages of the disease. (4) That even where the disease is more advanced and a tumor perceptible, an exploratory operation is as a rule still advisable in order to carry out radical or palliative treatment. (5) That where the disease is too extensive for any radical operation to be done the palliative operation of gastroenterostomy, which can be done with very small risk, may considerably prolong life and make the remainder of it much more comfortable and happy."

Syme,¹ of Melbourne, discusses the **surgical treatment of cancer of the stomach**. The author maintains that the results of operation for cancer of the stomach would improve if we applied the same principles to that organ that we do to the breast, uterus, and other parts—namely, early diagnosis and prompt radical removal. So long as we remain ignorant of the cause of cancer its treatment must be entirely surgical. A strong plea for early diagnosis is made and Hemmeter is quoted as follows: "The simple continuance of a chronic gastritis, or nervous dyspepsia, in spite of logical and scientific treatment, accompanied with progressive loss of body-weight, during 3 to 4 weeks, justify the suspicion of latent gastric carcinoma." In addition to the symptoms of progressive emaciating gastritis, valuable aids to early diagnosis are loss of gastric motility and diminution of free HCl in the stomach-contents. We should not wait for a palpable tumor before interfering surgically, but the existence of a tumor is not a contraindication to operation, as some have urged. Even should the diagnosis of gastric cancer prove incorrect on exploration, some other condition, benign in character but the cause of the symptoms, and which can be remedied, will generally be found. Next to early diagnosis the most important thing is early removal. Syme shows that it is the pylorus which is most frequently involved in gastric cancer, and that the disease extends first along the lesser and then along the greater curvature in the line of the lymphatics and blood-vessels, and that the tuberosity of the stomach is practically never invaded by extension from the pylorus. Another important feature of gastric carcinoma is that it shows little tendency to general metastasis. Not only is this true, but if a recurrence takes place after the removal it is mainly local. Gussenbauer examined 542 cases of pyloric cancer and in 41 % there was no metastasis. These facts all go to show the advantage of removing a large portion of the stomach instead of doing simple pylorectomy. It is advised that all the stomach except the great tuberosity, along with the glands in the gastrohepatic and great omentum, should be removed. Up to 1888 the mortality from the operation was about 60 %, and recurrence was the invariable rule. Kocher's mortality by his present method is 8.7 %, and out of 57 extirpations 11 were alive after such fairly long periods as to justify us in regarding them as cured.

¹ Intercol. Med. Jour. of Australasia, Feb. 20, 1903.

Willis McDonald collected 527 operations performed by various modern operators, and found that 43 patients were alive and free from recurrence 3 years after operation. Although the removal of the whole stomach is possible, Syme believes that it is a great advantage to leave the tuber and that there is little danger in doing so. In operations upon the stomach the author irrigates freely with normal salt solution, believing that it diminishes the irritation produced by the mere exposure of peritoneal-covered viscera. The first important step in the operation is to secure the main blood-vessels. Care must be taken in doing this to avoid injury to the transverse mesocolon. In discussing the use of clamps Syme refers to a case in which necrosis of the duodenum took place at the point at which the bowel was controlled by Kocher's clamp. The clamps, however, possess many advantages and greatly aid the performance of gastrectomy. If possible, the duodenum should be implanted on the portion of the stomach left, as it is the best substitute for the stomach to first receive the food. If this cannot be done, the duodenum should be closed and the jejunum attached to the stomach. The use of continuous sutures is advocated. If the disease is found to be too extensive for resection or if the adhesions are too numerous and dense, gastroenterostomy should be performed.

An interesting case of the **carcinoma of the pylorus** occurring in a man of **19 years of age** is reported by Anning.¹ The patient was operated upon by Littlewood and it was found that the growth involved the pylorus and the glands in the neighborhood to such an extent that a resection of the growth and removal of the glands seemed inadvisable. Posterior gastroenterostomy was therefore done, and gave absolute relief to all stomach symptoms until about the time of the patient's death, 8 months later. After death it was found that there was a general carcinomatous condition of the peritoneum and the abdominal viscera. The case was of interest because of the age of the patient, and because of the relief of symptoms from the gastroenterostomy.

Three cases of **diffuse carcinomatosis of the stomach and intestines** are recorded by Nuttall and Emanuel.² The authors do not think that such a condition has been previously described. In the first case the parts affected were the pyloric half of the stomach, the small intestine in places, and the entire colon, while the cecum was free from growth. In the second case the entire stomach was infiltrated, the small intestine in places, and the whole colon, the cecum being free. In the third case the entire stomach, the small intestine in places, the cecum, the colon, and the rectum were involved. In each case the growth in the stomach and large intestine could be described as "leather bottle" in character. In all the cases the great omentum and the mesenteric and retroperitoneal glands were free from growth. In each case the growth was a glandular carcinoma arising in the deep layers of the gastric mucous membrane and undergoing colloid degeneration.

In discussing **syphilis of the stomach**, Max Einhorn³ describes an

¹ Lancet, Nov. 22, 1902.

² Lancet, Jan. 17, 1903.

³ Münch. med. Woch., Dec. 2, 1902.

interesting case of **syphilitic tumor of the stomach**. Syphilitic growths bear a close resemblance to cancer, but they can be differentiated by the administration of antisyphilitic treatment. The case reported is that of a man 42 years of age who had for a number of years been troubled with symptoms of indigestion. He suffered from pain in the stomach, the appetite was poor, and the bowels were constipated. He had lost some weight. Twelve years previous to his present illness he had contracted syphilis. A resistant tumor could be palpated in the epigastrium. The growth presented an irregular, nodular surface, and measured 5 cm. in length and 2 cm. in breadth. The stomach-contents showed free HCl. The case was at first thought to be one of cancer, but the long duration of the disease, the presence of free HCl, and the history of syphilis caused Einhorn to place the patient upon antisyphilitic treatment. After 6 weeks of this treatment the tumor had entirely disappeared and the patient had increased in weight and strength. After 3 months of treatment he was perfectly well.

Bird,¹ of Melbourne, describes a case of **sarcoma of the stomach**. In this case Bird performed a successful partial gastrectomy. The patient was a man 41 years of age. The principal symptoms were considerable loss of strength and some loss of weight. The only gastric symptom was a tendency to flatulence after food. A distinct tumor, however, could be felt in the pyloric region, which presented a remarkable range of movement. There was no obvious dilation of the stomach. When the abdomen was opened, a large tumor involving the pyloric antrum and a portion of the anterior wall of the greater curvature of the stomach was encountered. The two unusual features here were the rather extensive involvement of the duodenum and the want of involvement of the lesser curvature. After removal the gastric tumor measured 5½ inches from side to side, 5¼ vertically and 1¼ in thickness. The infiltration of the duodenum necessitated its removal nearly as low down as the entrance of the bile-ducts. Considerably over one-half of the stomach was removed with the growth. The absence of adhesions which are so characteristic of carcinoma of this size rendered the manipulation of the organ easy, but the removal of so large a portion of the duodenum rendered the anastomosis between the remaining portion of the stomach and this portion of the bowel very difficult. It was, however, accomplished, and the patient recovered. Until lately sarcoma of the stomach was looked upon as a great rarity. The Fenwicks, however, have estimated that it is present in about 5 % to 8 % of all primary neoplasms of the stomach. [There are over 60 cases of gastric sarcoma on record. In 25 % of cases the pylorus is involved, but stenosis is rare. It is more common in early life than cancer.]

A. MacCormick,² of Sidney, presents brief histories of 6 cases, occurring during the last 3 years, in which **pylorectomy was performed for cancer**. The author's first pylorectomy was done in 1890 and the patient lived 7 years. Four of these 6 later cases were well when last

¹ Intercol. Med. Jour. of Australasia, Feb. 20, 1903.

² Australasian Med. Gaz., Dec. 20, 1902.

heard from; and of the remaining 2, one died of secondary hemorrhage from the portal vein due to ulceration at the duodenal stump 17 days after operation, and the other died of bronchitis one month after operation. In performing pylorotomy MacCormick prefers the method of direct suture of the divided ends, but if much stomach has to be removed or if there is little duodenum available, he prefers gastrojejunostomy with blind suture of the stomach and duodenum. A separate suture of the mucous membrane the author believes does much to lessen the tendency to cicatricial contraction and to lessen the surface exposed to infection.

Vander Veer¹ reports 2 cases of **gastrectomy**. In the first case the cancer involved the greater curvature and the cardiac end of the stomach, necessitating the removal of the entire organ. The cardiac end of the esophagus was anastomosed to the duodenum by means of a Murphy button. There was some difficulty in approximating the two structures and considerable tension was present after they were attached. The patient died the day following the operation, and the autopsy showed that the duodenum had separated from the esophagus. In the second case, one of round-celled sarcoma of the stomach, the stomach was excised at about 2 inches anteriorly and 3 inches posteriorly from the cardiac end and just below the pylorus. An anastomosis was performed with silk sutures. The patient recovered and 9 months after the operation was able to work in a blacksmith's shop and was apparently in full health.

Moynihan² reports a case of **partial gastrectomy** and presents some remarks upon the **treatment of malignant disease of the stomach**. A careful study of gastric cancer shows: "(1) That malignant disease of the stomach begins in the majority of instances near the pylorus just below the lesser curvature. (2) From this point it spreads most rapidly and most widely in the submucosa. (3) The rate of growth toward the cardiac orifice is rapid, toward the duodenal side extremely slow. The duodenum is rarely affected extensively. (4) The tendency of the growth is to drift toward the curvatures." The accompanying illustrations (Figs. 24 and 25) show the distribution of the lymphatic vessels and glands and the point at which it is safe to divide the stomach in cases of pyloric cancer. The portion spoken of as the "isolated area" is rarely affected by cancer spreading upward from the pylorus. An examination of a large number of specimens shows that this area remains unaffected to the last, and that its lymphatic vessels and glands are very rarely involved in the spread of the disease.

A case of **total gastrectomy** is reported by Mayo Robson³ as well 18 months after operation. The patient was a man 38 years of age who was suffering from a malignant growth involving nearly the whole of the stomach, the only portion of the organ free from the growth being a small area to the left of the esophageal opening. No enlarged glands were found nor any evidence of secondary deposits. The duodenum was

¹ Amer. Med., Oct. 25, 1902.

² Brit. Med. Jour., April 25, 1903.

³ Brit. Med. Jour., Nov. 8, 1902.

divided about an inch from the pylorus and all the stomach save the portion free from growth was removed. The anastomosis was accomplished with a bone bobbin. The patient has gained much in weight, but has to limit the amount of food taken at each meal. Robson states that although the mortality of the reported cases of complete gastrectomy is but 33 %, he is sure the unreported cases will bring the mortality to 50 %.



Fig. 24.—The lymphatic vessels and glands of the stomach; c is the "isolated area" (Moynihan, in Brit. Med. Jour., April 25, 1903).

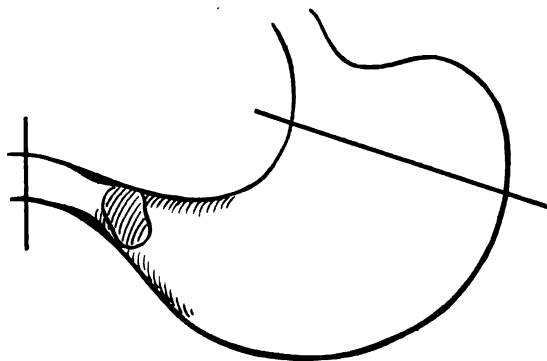


Fig. 25.—Showing the growth at the pylorus, the extensions along the curvatures, and the lines of incision in the stomach and duodenum (Moynihan, in Brit. Med. Jour., April 25, 1903).

Syme¹ reports a case of **total gastrectomy successfully performed** for carcinoma of the pylorus and lesser curvature of the stomach in a woman aged 55 years. The author states that compared with pylorotomy the operation performed in this case was easier and took less time, because there was less stomach surface to suture. Although the whole stomach was not involved, a large portion of the lesser curvature was, and for this reason it was deemed advisable to do a complete operation. A small portion, however, of the greater curvature at the cardiac end was left. A few obviously large and hard glands were also removed.

¹ Lancet, Sept. 13, 1902.

The patient made a prompt recovery from the operation. Small quantities of water were given by the mouth on the second day after the operation, and feeding was gradually increased until the patient was given full diet. At no time did the giving of food produce discomfort. The patient was discharged about 4 weeks after the operation. The operation was done on May 8, 1902.

Acute dilation of the stomach is discussed editorially in the *Lancet*.¹ Reference is made to a number of cases of death following operation from acute dilation. The postoperative form of acute dilation of the stomach has been ascribed to the effect of the anesthetic on the gastric nerves; others have attributed the lesion of the stomach to interference with the solar plexus at the operation, but there is little to support these theories, and it is much more probable that most of these cases of acute dilation of the stomach are septic in origin. Perhaps the germs of their toxins may have a direct effect on the gastric muscular wall, or perhaps they may act on the abdominal plexuses of the sympathetic nervous system. At present it is impossible to come to a decision on this matter, but a general survey of the recorded cases goes far to establish the probability of a microbic cause. Careful bacteriologic observation in future cases may assist in establishing or disproving this theory.

Death from acute dilation of the stomach following an operation for an acute ischiorectal abscess is reported by Frederick W. Stewart.² The symptoms of acute dilation occurred 11 days after the operation. The patient was suddenly seized with severe pain in the epigastric and umbilical regions and at the same time vomited a large amount of bile-stained fluid. The stomach was enormously distended. In spite of treatment the dilation continued and the patient died 2 days after the onset of the symptoms. At the necropsy the stomach was found to be empty and much dilated, its capacity being 10½ pints. Stewart believes that this case is a similar one to those few described by Fagge as "acute paralytic distention," and that it should be classed in this category. The association with the operation is looked upon as purely accidental.

Moynihan³ presents a note on **gastric tetany**. The author is not inclined to look upon the condition as one so rare as is generally supposed. In the first 50 cases of gastroenterostomy there were 4 patients who had suffered in a greater or less degree from gastric tetany. In 3 of these the tetany did not amount to more than painful cramps of the legs and thighs, or of the hands, and was generally present only in the early hours of the night. In the most severe cases which Moynihan has observed the tetanic condition manifested itself on two occasions immediately after gastric lavage. The 5 cases Moynihan has observed have all been in males; all have been due to simple diseases; in all gastroenterostomy has been performed, and all the patients have recovered. It is probably not too much to say that the extreme form of gastric tetany is a preventable disease. The timely performance of gastroenterostomy would remove the cause, whatever that may be, of the attacks.

¹ *Lancet*, April 11, 1903.

² *Lancet*, May 9, 1903.

³ *Practitioner*, March, 1903.

A case of **recovery after operation for gunshot wound of the stomach** was reported by Hugh Williams.¹ The patient was a boy of 16 who was shot at close range with a 32-caliber revolver. The wound of entrance was 1 inch to the right of the umbilicus and a half inch below it. The injury was received about half an hour after eating a full meal. The patient did not vomit, but complained of severe pain in the epigastrium and was unable to urinate. Williams saw the patient 4 hours after the injury, when he was perfectly quiet and in excellent condition. When the boy was prepared for operation, a probe was passed obliquely into the abdomen, entering it at the median line 2 inches above the umbilicus. The abdomen was opened in the median line between the ensiform and umbilicus. Free gas was found in the peritoneal cavity, but there was no free fluid of any kind. An oblique wound was found in the anterior stomach-wall, the visceral peritoneum being lacerated for an inch before the ball had entered the stomach-wall. After passing half an inch, the ball apparently had turned backward and entered the stomach. The wound of entrance was about 2 inches above the lower border of the stomach and 4 inches from the pylorus. During the manipulations of the stomach a small quantity of liquid escaped, though there was no evidence that any fluid escaped before the operation. The stomach itself was distended with a semi-solid mass of food. The stomach was isolated from the rest of the cavity by gauze pads after partially closing the wound of entrance. The lesser peritoneal cavity was then opened and the posterior wall of the stomach was carefully examined, but no wound was found. Fearing that with a stomach full of food vomiting might produce serious damage to the suturing, Williams determined to empty this organ, and, after enlarging the wound on the anterior wall, did so. The external surface of the stomach was then carefully searched, but there was still no evidence of a wound of exit, nor was the bullet found. The wound was then closed, a small wick was passed into the lesser peritoneal cavity and another to the line of sutures in the stomach. The patient recovered, being fed for a week entirely by the rectum. A question of great uncertainty in this case is the course and point of lodgment of the ball. The points which Williams especially calls attention to are the necessity for drainage in these cases and the importance of emptying the stomach when it is full at the time of operation.

N. Senn² strongly recommends the **purse-string suture in repair of gunshot wounds of the stomach**. He states that it makes an efficient closure and saves time. He also recommends that a posterior wound should be required through the anterior wound, which should be sufficiently enlarged to permit the posterior closure to be made. In case the lesser peritoneal cavity is infected by the extravasation of stomach-contents, it can be effectually irrigated through the wound in the posterior wall and an opening in the gastrocolic omentum. A catgut suture should be employed for closing these wounds. Senn reports 4 experiments upon dogs in which he has inflicted and closed stomach wounds. In each case the dog recovered, was killed later, and the wounds were found in excel-

¹ Boston M. and S. Jour., Dec. 28, 1902.

² Jour. Am. Med. Assoc., Nov. 8, 1902

lent condition. It was found that in the course of 3 weeks the continuity of the mucosa at the seat of the injury was completely restored.

An interesting case in which recovery took place after a **minie ball wound of the stomach** is described editorially in the *Boston Medical and Surgical Journal*.¹ The patient was shot at Bull Run, the ball entering and passing apparently directly through the abdomen. The patient stated that he lay upon the battlefield for 9 days without food and had only water, which the enemy gave him. Later he was removed to a hospital and the ball was extracted from his back. This man died recently, and a careful postmortem examination revealed the course of the bullet. It had penetrated both walls of the stomach, but injured neither the kidney nor pancreas. This wonderful recovery is thought to have been due to the fact that the patient's stomach was probably empty at the time of the injury and that he put little into it for a number of days.

J. C. Oliver² reports an interesting case of **unique foreign body in the stomach**. The patient was a girl 10 years of age who, after picking and eating persimmons, developed severe gastric pain. An emetic was administered which caused the child to vomit some persimmon seeds and other matter, but relief did not follow. An examination of the abdomen revealed a hard mass in the epigastric region, which was unchanged both in size and location after free emesis and catharsis. Oliver saw the patient about 8 days after she was taken ill. At this time she complained of some pain in the stomach, but there was no nausea or vomiting and the bowels moved in a normal manner. The history seemed clearly to associate the mass in the abdomen with the eating of the persimmons. The abdomen was opened and two large masses were felt in the stomach, one at the fundus and one near the pyloric extremity, and both were closely attached to the stomach-wall. The stomach was then opened and a futile attempt made to break down the masses for removal. Recourse was then had to a pair of scissors for this purpose. In this manner a mass of persimmon seeds, shells, leaves, twigs, etc., was removed piecemeal through the stomach opening. The entire mass weighed 9 ounces.

A **magnet for removing small foreign bodies from the stomach** has been described by Mayou.³ The magnet is made so as to fit an ordinary stomach-tube, the end of which is cut off and encircled by a silver band. The tube with the magnet is inserted into the stomach and brought in contact with the foreign body, this being done with the aid of the x-rays and the fluorescent screen. A case is reported of a boy 2 years of age from whose stomach a hairpin was removed with this instrument.

DISEASES OF THE PERITONEUM AND INTESTINES.

Tuberculous peritonitis is dealt with by A. E. Halstead.⁴ From a clinical standpoint this condition can be considered under two heads: cases in which ascites is predominant and those in which tumor-formation

¹ March 19, 1903.

² *Lancet*, Dec. 6, 1902.

³ *Jour. Am. Med. Assoc.*, Oct. 4, 1902.

⁴ *Amer. Med.*, Jan. 31, 1903.

is the distinguishing feature. The diagnosis of the first class of cases can be made only when all other possible causes of ascites are excluded. The history, especially of some antecedent tuberculous lesion, is of value. It usually occurs between the ages of 20 and 40, and it is more common in women than in men. The temperature is frequently subnormal. Pigmentation, especially of the face, is sometimes noted, and this may occur when the adrenals are not affected. In many cases the recognition of the disease is accidental. Emaciation, loss of appetite, and diarrhea are symptoms which vary with the acuteness of the disease. The ascitic form of tuberculous peritonitis is the most frequent variety, although a moderate amount of fluid is observed in all forms of the disease. When of rapid onset the disease may be confused with acute peritonitis of gonococcic or pneumonococcic origin. Puncture and bacteriologic examination of the fluid withdrawn are the only means of differentiation. The presence of the tubercle bacillus can only rarely be demonstrated in the tuberculous ascitic fluid, and even the inoculation of guineapigs does not always yield positive results. Tumor-formations resulting from tuberculosis present great difficulty in diagnosis. Those tumors composed of rolls of omentum are frequently mistaken for carcinoma. The history of the patient still is of great value, especially that relating to the appearance of tuberculous pleurisy. Abdominal tumors produced by sacculated exudations are the most common as well as the most difficult of diagnosis. These tumors may be found anywhere, but usually occupy the middle zone of the abdomen, where they have many times been recorded as of ovarian origin. There is no way of distinguishing positively between sacculated effusions of tuberculous peritonitis and cystic tumors of the abdomen. Tumors formed from matting together of coils of intestine may simulate either solid or cystic growths and may be fixed or freely movable. The majority of cases of tuberculous peritonitis should be subjected to operative treatment. In the ascitic form evacuation and drainage are all that is required. Most of the cases cured by this method are of the acute miliary variety. The case should not be considered cured until 5 years have elapsed after operation. Up to the present time over 1500 cases of peritoneal tuberculosis treated by laparotomy have been recorded. In the ascitic form of the disease the operative treatment can be conservatively stated as giving from 40 % to 50 % of definite cures. In the adhesive form the recoveries are probably about 25 %. In the ulcerating caseating variety the benefit of laparotomy is questionable. The various hypotheses which have been suggested to explain the cure of tuberculous peritonitis by operation are as follows: (1) The action of the anesthetic; (2) psychic influences; (3) operative trauma; (4) removal of ascitic fluid depriving the tubercle bacilli of nourishment; (5) increased absorption of the peritoneum; (6) removal of ascitic fluid containing ptomaines; (7) inflammatory reaction following entrance of air; (8) destruction of tubercle bacilli by septic inflammatory reaction following opening of the abdomen.

H. F. Harris¹ reports minutely a **case of hypertrophic tuberculosis**

¹ Ann. of Surg., Nov., 1902.

of the intestine. The patient, aged 39 years, was an inmate of an insane hospital. The diagnosis was made postmortem, and among other changes noticed were: nephritis, and amyloid infiltration of the kidneys, cirrhosis and amyloid infiltration of the liver, tuberculosis of the peritoneum, atrophy of the pancreas, and hypertrophic tuberculosis of the small intestine with amyloid infiltration of the mucosa. An illustration accompanying the article represents a section of the ileum which shows a marked constriction in the caliber of the bowel. This is one of the common results of the thickening of the mucosa, and Harris places it among the prominent causes of chronic obstruction of the bowels.

Porter¹ gives a brief outline of the **treatment of tuberculous peritonitis and reports a unique case.** It is thought that the curative effect of light and air after the abdomen is opened is generally underestimated. The ascitic forms of the disease have yielded the best results from operative interference, and the ulcerating and caseating forms the worst results. Other tubercular foci are benefited by the opening of the peritoneum. In operating for this condition the incision should be free, adhesions should not be disturbed unless for the removal of tubercular deposits or for the relief of bowel obstruction, drainage should not be employed; irrigation with hot water may be beneficial. Chemic anti-septics should not be used unless there is a mixed infection. The abdominal cavity should be freely exposed to the light and air from 10 to 15 minutes. The author believes that both the x-rays and the ultra-violet rays of Finsen will be found of great value in this condition. The case reported is that of a girl, 14 years of age, who suffered from tuberculous ascitic peritonitis of the lower abdomen and pelvis, accompanied by a hernial protrusion, the sac of which was the seat of tubercular disease. This case was cured by excision of the sac, obliteration of the canal, median laparotomy, and removal of the fluid.

Barnard² discusses the **simulation of acute peritonitis by pleuropneumonic diseases.** He gives brief reports of 6 cases in which the resemblance to some form of acute peritonitis was markedly presented by one of the forms of pleurisy or pneumonia, or both. In many of these cases the patient did not complain of the chest condition, but referred the pain to the upper abdomen, and presented a rigid and tender abdominal wall. The pulmonary symptoms usually were marked enough for recognition after 24 hours. The most interesting and difficult case referred to was that of a girl with gastric ulcer, who was suddenly seized with severe abdominal pain and collapse. A perforated gastric ulcer was diagnosed and a laparotomy was performed. Nothing was found and the patient subsequently died from pneumonia. The autopsy revealed the gastric ulcer, but there was no tendency to perforation. Barnard believes that mistakes in diagnosis frequently occur in the hands of surgeons in the early stages of diaphragmatic pleurisies. If surgeons bore this fact in mind and more frequently examined the chest, mistakes would be less frequent. One of the most important differentiating symptoms is rapid respiration which is out of proportion to the pulse-rate.

¹ Jour. Am. Med. Assoc. Sept. 13, 1902.

² Lancet, Aug. 2, 1902.

The abdominal tenderness is found to be superficial, deep pressure with the flat of the hand often being possible. Another point of value is that the abdominal wall becomes soft for a moment at each respiration, which is not true in acute peritonitis. The temperature is usually much higher than in peritonitis. Irritation in continuity in the lower six dorsal nerves would explain the hyperesthesia and spasm of the abdominal wall.

Battle,¹ in a clinical lecture, discusses the importance of **early diagnosis of peritonitis**, referring to the frequency with which symptoms of perforation of the appendix are overlooked, and reporting briefly 4 cases which illustrate his remarks. In each of these cases there was a purulent peritoneal exudation of considerable amount within a few hours of the commencement of the illness, and in 3 of them a perforation of the appendix was present, and in the fourth an acute inflammation of this organ without perforation. In a large number of these cases the symptoms are insidious and do not become marked until the patient is in a very serious condition. Stress is laid upon the importance of the early recognition of peritoneal effusion.

Seven consecutive cases of **acute intussusception** are reported by Rigby.² These cases all came under the author's care at the London Hospital during 9 days between December 26, 1902, and January 3, 1903. Of these patients, 6 were operated upon, and 1 was beyond operation at the time of admission. Of the 6 operated upon, 5 recovered. This is distinctly encouraging, and a strong argument in favor of early resort to surgical interference in this too often fatal form of intestinal obstruction. Rigby states that no class of statistics can be of less value than these, since the operative mortality must vary enormously from time to time according to the pathologic conditions present in the intussusception. The moment the invaginated portion of gut becomes irreducible the mortality rises from 50 % to perhaps 100 %. The time at which operation is performed also greatly influences the mortality. Of the present series, there was but 1 in which the bowel was irreducible and gangrenous; in this case the intussusception was of a retrograde or ascending character and involved only the small intestine. A resection was done, but the patient died. Of the 5 successful cases, 4 were in children under 8 months of age. In no case was inflation with air or injection of fluid attempted. The futility of wasting valuable time with these means has been amply demonstrated. These methods are undesirable for two reasons: because of the danger of rupture of the bowel and because the reduction is apt to be incomplete. Rigby states that his experience has been that this condition is most frequently found in children of good physique. He thinks that vigorous peristalsis is most likely the cause of the trouble, and refers to the fact that the 7 cases here reported occurred in the 9 days following the Christmas festivities. In 3 cases the abdomen was opened by a median incision, and in the other 2 cases the opening was made in the lower portion of the right semilunar line. In every case the cecum, colon, and ileocecal juncture had to be brought up in the wound and manipulated outside the abdominal cavity in order to accomplish a reduction. The keynote of

¹ Lancet, June 14, 1902.

² Lancet, Feb. 7, 1903.

success in operating upon these cases is rapidity. In none of the cases here reported did the operation exceed 15 minutes. The greatest precautions were taken to prevent shock, the limbs and chest being encased in cotton-wool and the operation performed on a hot-water pillow. Another point which Rigby lays stress upon is the necessity for early feeding after operation. The children in this series of cases were fed as soon as they recovered from the anesthetic. There is great necessity for immediate operation in cases of intussusception, and it is urged that no time be lost in attempting inflation with air or injection of fluid.

A case of **transsacral removal of an intussusception complicated by a malignant growth** is reported by Barker.¹ The patient was a woman, aged 52, who suffered from a circular carcinoma causing an intussusception which had been upon a previous occasion reduced. The carcinoma was plainly palpable before reduction, but could be felt afterward. The intussusception recurred, and the cancer was easily felt with the examining finger at the apex of the intussusceptum. Barker first opened the left groin and attempted to draw the intussusception up, but found it impossible. The wound was then closed, the anus dilated, and a futile attempt made to pull the intussusception down so that it might be excised. When this had failed, all further efforts at this time were abandoned. A month later, however, the intussusception was attacked from below, and after the removal of the coccyx and a portion of the sacrum, the posterior wall of the rectum was divided, the intussusception withdrawn, a resection made, and an anastomosis established. Except for a slight fecal discharge beginning on the seventh day and lasting for a few days, the patient made a good recovery. Barker claims the originality for the proposal of this operation, which he recommended in 1887. He also suggests that it might be possible in some cases of carcinoma of the sigmoid without intussusception to open the rectum below the growth and pull it down and perform a resection, as was done in this case.

A case of **recurrence of intussusception after operation and reduction** is reported by Geoffrey Owen.² The patient was a child 7 months of age. The reduction was not difficult and the bowel not greatly congested. The patient did well for about 24 hours, when all the symptoms of intussusception again occurred and a second operation was done. A reproduction of the intussusception was found and again easily reduced. The child failed to rally, however, and died 24 hours after the second operation.

John F. Erdmann³ discusses **intussusception** and reports 3 additional **operative cases**, making the following summary of 12 cases which comprise his experience: "(1) There were 10 operative cases, of which 5 were of the ileocolic, one ileocecal, two enteric, one colonic, and one multiple—ileocolic and enteric, varieties. (2) Only one patient recovered by the use of injections. (3) One death occurred in which enemas, etc.,

¹ Lancet, May 9, 1903.

² Intercolonial Med. Jour. of Australasia, Oct. 20, 1902

³ Med. Rec., July 5, 1902.

had been used. No operation allowed. (4) Of 10 operative cases, 5 were fatal and 5 terminated in recovery; and of the deaths, 3 were cases in which operation was done as a last resort after all mechanical means had been exhausted, 2 being resections for gangrene and the third septic from a 7-days' duration of the intussusception. (5) The tumor could be palpated through the abdominal wall in 5 cases, while through the rectum only 3 cases were palpable. (6) Had we cases 1 and 2 to operate again, resection would not have been done, but a temporary enterostomy would have been made. Although the mortality rate is 50 % in the entire lot, it must be remembered that the cases terminating fatally were of 2½, 3, 4, and 7 days' duration when operation was done, and that of these, 3 patients were practically moribund at the time of operation." Since preparing the above contribution Erdmann has operated in 5 additional cases, all under 12 months of age.

A case of **intussusception occurring during convalescence from typhoid fever** is reported by Watkins-Pitchford.¹ The patient was a man 29 years of age, who had recovered from an attack of typhoid fever and had been going about taking solid food for more than 6 weeks. His debility, however, was still very marked. He was seized with a diarrhea, abdominal pain, and vomiting, which continued in spite of treatment for 3 days, and then he began to have evacuations of almost pure blood. No tumor could be felt, although intussusception was suspected. He died 6 days after the onset of diarrhea. At the autopsy there were 9 intussusceptions in the small intestine, all passing in the downward direction; 2 of them were double. The longest measured 5½ inches and the shortest 3 inches. There was no exudation of lymph in the peritoneal cavity.

Dobson² reports an interesting case of **invagination of Meckel's diverticulum** occurring in a boy 4½ years of age. The condition had existed 36 hours before operation. The symptoms were acute abdominal pain with vomiting, and the passage of blood and mucus by the bowels. There was also a palpable tumor in the right iliac region. Upon opening the abdomen an intussusception of the ileocolic variety was found and reduced without much difficulty until the apex was reached. At this point a Meckel's diverticulum was found invaginated and forming the apex of the intussusception. It was impossible to reduce it, therefore it was excised with a portion of the bowel and an anastomosis made. The abdomen was drained, as there was a large amount of free fluid in the cavity. The morning following the operation the patient was extremely ill, the pulse had risen, and death seemed apparent. One and a half pints of normal salt solution was given intravenously, free stimulation by strychnin hypodermatically was employed, and the lower bowel washed out. The result was a copious evacuation of extremely offensive bloody fluid, followed by the immediate improvement of the patient, with ultimately good recovery. Dobson refers to the 13 cases already reported of invagination of Meckel's diverticulum. If invagination takes place, it is essential that the apex of the diverticulum be free and not

¹ Brit. Med. Jour., Sept. 6, 1902.

² Lancet, April 25, 1903.

attached by ligament or adhesion to any other structure. It has been found in the large majority of cases impossible to reduce the invaginated diverticulum, although the invaginated bowel may be withdrawn. It is better in all cases to remove the diverticulum if it cannot be reduced. When resection is necessary, the question of anastomosis or the formation of a temporary artificial anus arises. It is a wise precaution to adopt drainage of the peritoneum whenever a plastic operation is done on the intestinal tract during an acute attack of obstruction.

A. E. Halstead,¹ of Chicago, in discussing **inflammation and perforation of Meckel's diverticulum as a cause of septic peritonitis**, relates 2 cases in which a Meckel's diverticulum was **perforated by a typhoid ulcer**. Halstead operated upon one of these cases and Wm. E. Schroeder on the other. False or retention cysts of Meckel's diverticula are divided into two classes: those in which the cavity is continuous with that of the intestine, and those in which it is shut off from the intestinal lumen. In those communicating with the intestine the contents are generally fluid or hard fecal matter. In the closed cysts the contents are often fluid and frequently resemble mucus. Cysts having the structure of the intestine are occasionally found in the anterior abdominal wall near the umbilicus. Their structure and location suggest their origin from the omphalomesenteric duct. "Inflammation of Meckel's diverticulum may result (1) from participation of the mucosa in a general inflammatory process involving the mucous membrane of the intestine; (2) from local causes, as obstruction of the lumen from twisting or kinking of the neck, or from foreign bodies and fecal concretions which may lodge in this pouch. Trauma also appears to have been the exciting cause of inflammation in some of the reported cases." Tuberculous ulcers of the diverticulum have been observed in 2 cases. Halstead's case of typhoid perforation of the diverticulum occurred in a man 26 years of age, who had been ill with typhoid fever for 4 weeks. The abdomen was opened under spinal anesthesia 5 hours after the symptoms of perforation. The peritoneal cavity was filled with liquid feces and pus. The diverticulum was $3\frac{1}{2}$ feet from the ileocecal valve and was 2 inches in length, and in diameter was about the size of the intestine. The perforation was at its extremity and sufficiently large to admit the tip of the finger. The perforation was closed, the abdomen irrigated and drained. The patient died 18 hours after operation. Autopsy showed numerous typhoid ulcers, but no other perforation. Schroeder's patient was a male 45 years of age, who developed symptoms of perforation in the second week of the disease. The perforation in this case was also at the tip of a Meckel's diverticulum. The diverticulum was attached to the anterior abdominal wall to the right of the median line and half-way between the umbilicus and the anterior superior spine of the ilium. The perforation was closed, but the patient died some hours after operation. Autopsy showed no other perforations. Halstead has been able to find but 2 cases of typhoid perforation of Meckel's diverticulum recorded. One of these is reported by Galton and is that of a child 12 years of

¹ Med. Rec., Nov. 29, 1902.

age who died on the eighth day of the fever with symptoms of peritonitis. At the autopsy two perforations were found, one in the ileum and one at the extremity of a Meckel's diverticulum. Another case is reported by Boinet and Delanglade, the patient being a woman 35 years of age. She was operated upon because of symptoms of perforation, and a perforated ulcer was found at the tip of a Meckel's diverticulum. The patient died 6 hours after the operation. In connection with the site of perforation in these cases it is interesting to note that examination of the tip has shown that the muscular layer is frequently defective at its distal end, thus permitting easy perforation of any ulcer of the mucous membrane at this point. Perforations following gangrenous inflammation from twisting or traction of the neck of the diverticulum are more common than those from specific ulceration of the mucosa. Reference is made to the frequency with which foreign bodies are found in diverticula. In none of the reported cases of inflammation of Meckel's diverticulum has a diagnosis of the true condition been made, the majority having been operated upon for appendicitis or intestinal obstruction.

In a case of **invagination of Meckel's diverticulum followed by an intussusception of the ileum** operation was done by Terry.¹ The patient was a boy 12 years of age. Although the symptoms of intussusception were acute, they were not very marked. A sausage-shaped tumor was easily felt in the right iliac fossa. When the abdomen was opened, an intussusception 12 inches long was encountered. The intussusception was gradually reduced, but the apex of the intussusceptum was found to consist in an invaginated Meckel's diverticulum, almost 6 inches in length, and sloughing. The diverticulum was removed and the boy made a good recovery.

Three cases of intestinal obstruction due to a Meckel's diverticulum are reported by James E. Moore.² In 2 of these cases operation was performed by Moore and in 1 by Abbott; all of them terminated in recovery.

Travers³ presents an interesting case of a boy in whom there existed an **intussusception of a Meckel's diverticulum with a secondary ileocolic intussusception**. The diverticulum was situated about 18 inches from the cecum. It is supposed that the secondary invagination of the ileum into the colon took place after the boy's admission to the hospital, and at this time there was a marked change in the physical signs. Although the examination of the abdomen pointed to an intussusception as the cause of obstruction, yet there was the absence of the classical symptoms of the passage of blood and mucus. The boy was operated upon, the intussusception reduced, and recovery followed.

An interesting case of **intestinal obstruction due to impaction with lumbricoids** is reported by W. O. Bullock.⁴ The patient was a child 6 years of age. He was not seen for 5 days after the onset of symptoms of obstruction, and he was not brought to the hospital until the sixth day. At this time he was in a condition of extreme emaciation, the

¹ Lancet, April 4, 1903.

² Jour. Am. Med. Assoc., Oct. 4, 1902.

³ Lancet, July 19, 1902.

⁴ Amer. Med., Jan. 31, 1903.

abdomen was flat, and a sausage-shaped mass could be easily made out in the right iliac region. His temperature was normal, but his pulse was from 130 to 140 and weak. During his illness he had vomited persistently and suffered with absolute constipation. He was operated upon on the day of admission. When the abdomen was opened, the distal end of the ileum was distended to the size of the ascending colon for a distance of about 8 inches and packed solidly with lumbricoid worms. For 8 or 10 inches more the bowel was filled with worms. The distention at the extremity of the ileum was so great that the worms could be felt readily through the bowel-wall. Ninety-two worms were removed through an incision in the bowel and after the operation 2 more were passed by the bowel. The child died 12 hours after operation.

Bowlby¹ discusses at some length **intestinal obstruction** and especially the diagnosis of this condition, confining his remarks to mechanical obstruction of the bowel within the abdomen. The symptoms of internal strangulation are sudden in onset and peritonitis and septic infection develop early. Peritonitis, particularly if due to appendicitis, more frequently simulates mechanical obstruction than does any other affection. Many of the affections of the solid viscera simulate obstruction, disease of the kidney being the most frequent. Acute pancreatitis and embolism of the superior mesenteric artery also produce symptoms resembling obstruction. Functional constipation and acute enteritis may be occasionally mistaken for intestinal obstruction. Bowlby relates cases illustrating each of his points in differential diagnosis, and does not urge that the abdomen be opened in every case in which symptoms of obstruction present themselves. A careful consideration should be paid to all symptoms and an attempt be made to arrive as nearly as possible at a diagnosis before deciding upon the treatment. When the abdomen is opened in a doubtful case the following steps are recommended: "(1) Open in the middle line below the umbilicus, because most of the causes of obstruction will be found in the lower half of the abdomen. (2) Without allowing any intestine to escape, examine first with two or more fingers, or even the whole hand, the right iliac region, and pass from there toward the umbilicus to feel whether there are any adhesions there. It is in this right lower half of the abdomen that most of the causes of obstruction are to be found, for here are (a) the appendix; (b) intestinal diverticula, perhaps attached to the umbilicus or to the neighboring mesentery; (c) the commonest site for volvulus, that is, the cecum; (d) the usual site for the lodgment of an impacted gallstone—that is, the lower part of the ileum; (e) a common place for adhesions due to caseous mesenteric glands; (f) the sites of inguinal, femoral, and obturator hernia. Further, if the obstruction be in the small intestine, it is in the right iliac fossa that undistended intestine will be found, and if this can be secured and traced upward it is the surest guide to the seat of obstruction. (3) Examine next the left iliac region and the pelvic region, the latter especially if the patient be a woman, for there, as additional causes of adhesions, may be inflamed ovaries or tubes or some uterine trouble with neighboring

¹ Brit. Med. Jour., Jan. 3, 1903.

inflammation. (4) If no cause can be discovered, then either open a coil of distended intestine and suture it to the skin, if the patient be too ill to bear more; or else decide to take the distended bowel out of the abdomen altogether, and if necessary open it, empty it, and suture it. It is only by so doing that you will be able to return it once you have decided to let it escape, and it is often only by so doing that you will find a deeply-seated obstruction."

H. B. Delatour¹ describes a number of cases of **acute intestinal obstruction** and reaches the following conclusions: "The sudden onset of obstruction of the bowels does not always mean the presence of a recent lesion, especially in those at or beyond 40 years of age. In many cases the symptoms may point to an attack of appendicitis, as the appendix becomes distended by gas or fecal matter. It is best in all cases where a new growth is suspected, or where there is much distention, to first make an artificial anus, and to use the cecum for this. At this time do not spend valuable time, and produce some shock, by making a thorough exploration of the entire abdomen, in order to satisfy yourself of the exact condition. Always open the intestine immediately, as you need to give relief as soon as possible, and there is no danger of leakage of feces back into the abdomen, provided the exit at the anus is not blocked by too tight dressings. Better leave the wound exposed, the nurse being instructed to clean away the fecal matter as it appears. Do not be contented to leave these cases with the artificial opening, unless at the primary operation the tumor has been found immovable and anastomosis impossible, for many cases may live months with the tumors *in situ* if the current of fecal matter is diverted by placing the loop of intestine containing it out of the fecal current."

E. Wyllys Andrews² reports 2 of his own cases and refers to a number of others in which death has occurred before, during, or after operations for **intestinal obstruction and septic peritonitis** from drowning of the patient in **fecal vomit**. His conclusions are as follows: "(1) Flooding of the air-passages by fecal vomit is a real danger, and probably has caused many unexplained deaths. (2) Resuscitation is impossible or very difficult. (3) The fluid may flow by gravity through the relaxed stomach sphincters directly out of the intestine where it has accumulated in enormous quantities. (4) The accident occurs with great suddenness and with a stomach supposedly empty. The suffocation may be so complete that no outcry is made and may not be noticed by the attendant. (5) It may occur as late as an hour after anesthesia, or at any time until consciousness is restored. (6) We have no evidence that it can occur during consciousness even *in extremis*. (7) After septic laparotomy, patients, when returned to bed, should be watched without even momentary intervals to full consciousness. (8) A suggestion made to me by Dr. McArthur, that operation under cocain-anesthesia, be done in as many as possible of such cases, seems to me sound in the light of the above report."

Perforation of the bowel in typhoid fever is discussed by G. E.

¹ Med. Rec., Oct. 18, 1902.

² Ann. of Surg., June, 1903.

Armstrong,¹ who bases his remarks upon 34 cases of perforation occurring in 932 cases of typhoid fever treated during the past 6 years in the Montreal General Hospital. In 1 case the perforation was first recognized at the autopsy. This case was of a most malignant type, with tympanites, dulled sensorium, and profound toxemia. In the other 33 cases the perforation was recognized during life and operated upon. Five of these recovered and another lived 5 days, the death at this time being reported by the pathologist due to typhoid toxemia and not to perforation. Including this case, the percentage of recoveries was 18.18 %. The percentage of recoveries among female patients was twice as great as that among males, and this tallies with the statistics of Keen. This difference in the mortality-rate caused Armstrong to ask whether the thoracic type of respiration in woman results in a more limited diffusion of the escaped intestinal contents. He has been struck with the frequency with which many of the patients persisted in going about for days and in some instances for a week or more after the onset of typhoid symptoms. In several cases the initial pain was complained of during or shortly after a bath, but the hospital records show no increase in the percentage of perforations since the adoption of tubbing. Regarding the diagnosis, Armstrong states that it cannot be too strongly urged that with the onset of ominous symptoms the physician should associate with himself a surgeon of experience in abdominal work. The note of alarm is pain,—“abdominal pain referred to the umbilical or hypogastric regions. A very common bedside note is to the effect that ‘at midnight on a certain date the patient complained of the sudden onset of abdominal pain; an enema was given and followed by a stool, semisolid or watery, which gave great or complete relief. About 4 hours later the pain recurred, and the abdomen was then found to be tender on pressure at some point,—more frequently in the right hypochondrium,—and more or less rigidity with rounding up.’” It would seem that the administration of enemas is a mistake, and yet physicians state that the giving of an enema will not infrequently permanently relieve suddenly occurring abdominal pain. The first difficulty then resolves itself into the question of differentiating between colic and abdominal pain secondary to organic lesion. It can only be done by carefully studying the associated symptoms. The association of localized tenderness in a fixed spot and rigidity with pain should arouse one’s most active suspicions. The change in type of respiration from abdominal to thoracic Armstrong has been led to believe to be of considerable significance. The temperature frequently rises or falls notably, but not invariably by any means. The same may be said of the pulse. Vomiting or nausea frequently occurs. The diagnosis of a small pin-point perforation, particularly if near the cecum where a state of rest is more possible, and especially if sealed or temporarily closed by adherent omentum or an adjacent coil of intestine, is particularly difficult. The most important diagnostic feature in such a case is the *persistence* of a little pain, a little tenderness, and a little rigidity, with fluctuation in temperature and pulse. If these symptoms

¹ Ann. of Surg., Nov., 1902.

are due to colic, they should disappear in a few hours or change their location. The occurrence of perforation in a patient profoundly toxic, almost comatose, with a tympanitic abdomen, may be absolutely unrecognizable by the most astute clinician, and only be found in the autopsy room. The author puts little reliance upon the **leukocyte-count**, although he believes it should be carefully observed and considered in association with the presence or absence of other symptoms. He relates a number of cases in which the count was below the normal and in which perforation had occurred, and also instances in which the count was very high and yet no perforation was found. It is thought to be true conservative surgery to recommend an exploratory incision in cases of doubt rather than to wait and take chances. Armstrong has on two occasions opened the abdomen without finding any perforation. In one case no cause was found for the pain and in the other swollen mesenteric glands were discovered. Both patients recovered. Failing to find a perforation in any case, a careful examination of the mesenteric glands, the appendix, and the sigmoid flexure should be made. Having made a diagnosis of perforation, every means possible should be employed to localize the seat of trouble. This is best accomplished by arresting peristalsis so far as possible by prescribing absolute rest in bed, the withholding of all food by the mouth, avoidance of laxatives and enemas, and the application of ice to the abdomen. The question of delaying operation until some hours after perforation is considered, but advised against. In the Montreal cases the operation was performed during the first 12 hours in 10 cases, with 4 recoveries, or 40 %; during the second 12 hours in 10 cases, with 1 recovery, or 10 %. Of those operated upon after the second 12 hours, all died save one operated upon on the seventh day. This, however, was practically only the opening of a localized abscess. These figures support the author's attitude, and he urges early operation without waiting for recovery from shock. It is his belief that marked shock indicates a large perforation or at least the escape of a considerable quantity of the contents of the bowel. In the majority of cases shock is absent at first. It is thought we should aim to anticipate shock and by so doing give aid while the infection is still confined to the narrowest possible area. In many cases there is a period of a few hours immediately following the perforation during which things seem to remain almost *in statu quo*. This quiescent period is the surgeon's opportunity. Operations done at this time may possibly find beginning peritonitis from infection through the still intact base of an ulcer. That localized peritonitis can result from infection through the thin and altered base of a typhoid ulcer is now generally admitted; and that even fatal general peritonitis may result from infection through such a base and without macroscopic perforation is proved to be true by the Munich autopsies, in which peritonitis was present without perforation in 2.2 % of the cases. We have the best possible reason, then, for interfering if we think a perforation has occurred, because by so doing we give the patient the only chance there is of recovery. Armstrong holds that early operation anticipates shock in most instances, anticipates perforation or

rupture of a suppurating mesenteric gland in a few instances, and may occasionally be done in time to relieve the conservative adhesion of omentum or other serous surface before it is forcibly separated by peristaltic or intrainestinal pressure. As a great majority of the perforations occur in the terminal 18 inches of the ileum, the lateral incision is usually indicated in early operations. A number of cases in the series considered have succumbed to a second or third, and in one instance to a fourth, perforation. This fact emphasizes the necessity for making a careful inspection of the bowel after closing one perforation in order that all suspicious looking and feeling ulcers may be inverted. Irrigation and drainage is recommended. "If the patient is in good condition, without pulmonary complications or renal insufficiency, ether-anesthesia gives the surgeon a better opportunity for thoroughness; but in bad conditions, especially with renal disease, one can get along very well with local anesthesia. These patients are often extremely toxic and apathetic. The sensorium is dulled and the sensitiveness to pain lessened."

In a discussion of **typhoid perforation** the surgical remarks are made by Robert G. Le Conte.¹ It is stated that the sooner operation is undertaken after perforation occurs, the greater will be the changes of success. The delay in operating is due to the difficulty in making a diagnosis or because the classical symptoms are awaited. In hospital practice delay is caused frequently by waiting for the consent of relatives or friends. It is recommended that in hospital practice this consent for operation should be gained in all cases of typhoid fever before perforation takes place. The time for a successful operation is the moment the diagnosis is probable and not when it is made certain by the signs of peritonitis. It is a mistake to await the subsidence of shock after a perforation. The incision recommended is that in the right semilunar line. If the point of perforation cannot be located through this incision, and if yet the signs of perforation are present, the median incision should be made and the sigmoid flexure, descending and transverse colon, and then the remaining portion of the small bowel be examined in the order named. It should be remembered that the perforation may be completely hidden from sight by lymph, and therefore all areas that are covered by lymph should be carefully examined. When the perforation is found, it should be closed with sutures, either transverse or longitudinal, according to which produces the least narrowing of the bowel. Interrupted mattress sutures give the best support with the least danger of cutting. After the closure of the perforation other threatening points or points of perforation should be sought for. If it is not practicable to close the ulcer because of its size or because of the friability of the bowel about it, four procedures are open: First, a plug of omentum may be fashioned to fit the opening and be held in place with stitches. Le Conte states that he has seen on the postmortem table a perforation perfectly closed in this manner by nature, the omentum protruding well into the lumen of the bowel. Second, resection of the bowel may be practised. This is a procedure which can rarely be done with success in typhoid fever. Third, an artificial anus may be formed. This will be practicable

¹ Phila. Med. Jour., Dec. 13, 1902.

only in cases with a single perforation, and if successful will frequently require a second dangerous operation to close the opening. Fourth, the damaged area of the intestine may be separated from the general peritoneal cavity by walls of gauze. Le Conte has successfully employed this method and recommends it. Of the four procedures, however, the plugging of the opening with omentum, in the very limited number of cases to which it is applicable, is to be preferred. Resection of the bowel, as well as the establishment of an artificial anus, should be reserved for exceptional cases. In those rare cases in which a perforation produces a localized abscess, the parietal peritoneum forming a portion of the wall of the abscess, the treatment should be drainage. If a wall is not so formed, the mass should be walled off with gauze, adhesions be broken up, and perforations should be sought for and dealt with. Time counts for a great deal, and the simplest and shortest procedure should always be chosen. Where the area of infected peritoneum is limited it is recommended that the peritoneal cavity and intestines be cleansed with sponges and irrigation be not performed. When the peritonitis is extensive, copious douching is recommended. Drainage should be thorough, and after the operation the patient's head should be elevated to cause gravitation of the fluids to the pelvis. At the Pennsylvania Hospital during the past year there were 509 patients with typhoid fever, 36 of whom died, a mortality of 7 %. Of this number, 8 were transferred to the surgical wards for perforation and operated upon; 1 recovered. During this period 3 cases of perforation were admitted directly to the surgical wards and immediately operated upon and all recovered. In 2 of these cases a diagnosis of appendicitis was made prior to operation.

Geo. L. Hays,¹ of Pittsburg, discusses **perforation in typhoid fever**, his remarks being based upon 7 cases operated upon with 3 recoveries. The following table presents the interesting points in each case:

CASE.	AGE.	SEX.	DAY OF DISEASE.	LOCATION OF PERFORATION.	ANESTHESIA.	TIME OF OPERATION AFTER PERFORATION.	RESULT.	REMARKS.
I	32	F.	Sixteenth.	Ileum.	Cocain.	20 hours.	Died.	Death occurred 5 hours after operation.
II	30	M.	Twenty-first.	Ileum.	Cocain.	8½ hours.	Recovered.	
III	28	M.	Fifteenth.	Ileum.	Cocain.	12 hours.	Died.	Death occurred 30 hours after operation.
IV	36	M.	Nineteenth.	Ileum.	Cocain.	5 hours.	Recovered.	The patient developed a catarrhal pneumonia and a fecal fistula.
V	25	M.	Thirty-ninth; thirteenth day of a relapse.	Ileum.	Cocain.	4½ hours.	Recovered.	The perforation occurred during a relapse; the typhoid bacillus found in fluid of abdomen.
VI	30	M.	Thirteenth.	Ileum.	Cocain.	6 hours.	Died 48 hours after operation.	Death caused by acute obstruction by kinking of bowel; typhoid bacillus found in abdominal fluid.
VII	25	M.	Twenty-sixth.	Ileum.	Cocain.	12 hours.	Died 18 hours after operation.	Streptococcus pyogenes was found in the abdominal fluid.

¹ Amer. Med., Sept. 6, 1902.

In discussing the symptoms Hays states that the drop in temperature which is so often spoken of occurred in but 1 case of his 7, and in this was not very marked. The greatest symptomatic value is placed upon pain followed by rigidity and tenderness with suppression of peristalsis. Such symptoms call for surgical interference. The cases in this series go to prove the value of early operation. Cocain-anesthesia was employed in all the cases and the operation was performed with but little discomfort to the patients. In all but the last 2 cases Hays employed a median incision. In these the incision was made in the right semilunar line, and it is this incision which he believes to be most desirable. Flushing of the peritoneum with salt solution is advocated, and in all the cases here reported a large glass drainage-tube was inserted into the pelvis. After operation the head of the bed should be elevated so as to cause the fluids to gravitate to the point of drainage. The drainage-tube should not be removed until the fluids drawn from it are found free from pus-producing organisms or until firm adhesions have taken place about it. The case in which the patient died from acute obstruction due to a kink of the bowel presented a most hopeful outlook until the symptoms of obstruction arose. [This series of cases with a percentage of recovery of 42.85 certainly is most encouraging, and should make us consider the points which they seem to emphasize, namely, the necessity for early operation, the use of cocain as an anesthetic, the irrigation of the abdomen, and thorough drainage. Raising the head of the bed, a procedure suggested by Fowler, we believe a useful plan after operation.]

Thomas McCrae and James F. Mitchell,¹ of the Johns Hopkins Hospital, discuss at length the surgical features of typhoid fever, presenting a summary of all the cases of typhoid occurring in the wards of the Johns Hopkins Hospital from June, 1900, to June, 1902. This 2 years' experience is summarized as follows: "(1) There have been treated 275 cases. (2) Of these a certain number had unimportant complications, as boils or abscesses, the cultures from which in every instance yielded pyogenic cocci. (3) Periostitis and perichondritis have been seen occasionally, always subsiding without surgical interference. (4) Glandular affections, especially mastitis, occurred, but were not serious. (5) Abscess of the liver occurred once with recovery, the cultures being practically negative. (6) There have been symptoms of cholecystitis in 5 cases, of which 3 subsided without operation, 1 patient was operated upon and recovered, while in 1 the gallbladder ruptured and general peritonitis resulting in death followed. (7) Appendicitis was suspected on admission in 3 cases and developed once during the course of typhoid fever. (8) Perforation of the intestine occurred in 8 patients. Of these, 7 were operated upon with 2 recoveries, a third dying of toxemia after a week. All of these 7 were recognized within 9 hours, except 2, in which hemorrhage from the bowel accompanied the perforation. In 1 case operation was not advised because the patient was evidently *in extremis*. (9) Exploratory laparotomy was done in 2 cases in which no perforation was found. In one the symptoms proved to be due to intestinal hemorrhage;

¹ Amer. Med., Sept. 6, 1902.

in the other, to a low grade of peritonitis. The first patient died; the second recovered. (10) Eleven patients with suspicious abdominal symptoms were not operated upon. Of these, 2 died and the autopsies showed no perforation. The remaining 9 recovered." The authors' discussion of the perforation cases is deserving of special attention. If a patient has been having abdominal symptoms for some days, the onset of perforation may mean little change and only the development of extensive peritonitis may be recognized. So frequently do suspicious abdominal symptoms, such as pain and tenderness, perhaps associated with leukocytosis, clear up completely, that they cannot be considered as warning symptoms. They should, nevertheless, make us most careful in our observation of the patient. Four of the cases of this series of 8 perforations presented no abdominal features before perforation; 3 had distention, rigidity, and abdominal pain accompanied by leukocytosis. In 1 case there was intestinal hemorrhage on the day preceding perforation. The onset of pain was sudden in all but 1 case; in this there was pain throughout the whole course of the fever, and the time of perforation could not be fixed. The patients usually cried out with pain so as to attract the attention of the nurses or attendants. In 2 the pain came on during a tub bath, and in 1 case while the patient was on the bed-pan. The pain was usually severe and was referred to various parts, but most often to the lower abdomen in the umbilical region. In 2 instances it began in the penis and extended into the abdomen. In 2 cases the pain and perforation were accompanied by hemorrhage from the bowels; in one of these a chill accompanied the onset. Profuse sweating was twice noticed. A noteworthy fact is that in only 1 case was there any drop in temperature at the onset, and in this case it was immediately followed by elevation, and that in 6 cases there was immediate elevation after the onset. The symptoms after perforation depend upon the position of the perforation, the organisms escaping into the abdominal cavity, and the general condition of the patient. These are considered under two heads—general symptoms and local abdominal features. The facial expression in this series of cases varied greatly. Collapse was present only twice, and both times in association with hemorrhage. In 1 case there was no change in temperature. In 7 there was a slight elevation following the perforation, and this in 6 instances was followed by a fall in temperature, although most marked in the case in which hemorrhage accompanied perforation. In 6 cases the pulse-rate increased, in 2 suddenly, in 4 gradually; in the remaining 2 there was practically no change. The respirations were unchanged in 3 cases. Nausea and vomiting were observed in only 1 instance, and in this occurred somewhat late. Hiccough occurred in 3 cases, and in 2 of them it was rather a late symptom. In 5 cases the bowels moved after perforation; 1 of these was a case of general peritonitis. In 2 cases the stools contained large amounts of blood, and in 1 there was diarrhea with pain. Three patients expelled flatus after perforation. The leukocytosis varied from the normal to 17,500. Of the local abdominal features pain was a prominent one in 7 of the 8 cases; in the eighth it was severe at the onset, but disappeared

after the administration of opium. In 5 cases it was paroxysmal. In 3 instances the abdomen was natural and without distention; it was distended in 4, and in all of these 4 the distention existed before perforation. There was no case which showed immediate diminution of abdominal respiratory movements, and in 4 instances abdominal respiration was marked throughout. In 3, abdominal respiration was diminished. Rigidity was present in some degree in all cases, being greater on the right side in 3 and fairly general in 3. In 1 case it appeared only as a late symptom. Muscle spasm was never an early symptom. Tenderness on palpation was an early and striking sign, but varied much in degree. The absence of liver-dulness varied greatly. Dulness in the flanks was made out in 5 cases, in 2 of which it was distinctly movable. The perforation was recognized within 9 hours of its occurrence in 5 cases, but in the 2 with hemorrhage it was not diagnosticated until 24 hours had elapsed. The combination of hemorrhage and perforation is not rare. It is suggested that morphin should be given hypodermatically rather than by the mouth to control the hemorrhage. As to the diagnosis of perforation, one has but to see a few cases to appreciate the fact that there is no regularity in the symptoms, and that no symptom or group of symptoms is pathognomonic. Much depends upon seeing the patient at the onset of symptoms, and it is at this time that the surgeon should see the patient with the physician. It is hopeless to attempt to recognize the perforation by any combination of signs. The sudden onset and the pain are the two most valuable indications of perforation. The other symptoms accompanying the pain vary greatly, as shown in the present series of cases. Tenderness and rigidity are also of the greatest value. The absence of other symptoms is of no importance, though their occurrence would be of great importance. Exploratory operation under cocain when there is reasonable doubt is considered to be wise surgery. The shortest time elapsing between perforation and operation was $3\frac{1}{2}$ hours. The patients recovering were operated upon 13 and $7\frac{1}{2}$ hours respectively after perforation. In 3 of the cases cocain followed by whiffs of chloroform after the peritoneum was opened was employed; in the other 4 cases cocain alone was used. The incision of choice is through the right rectus muscle. In 3 cases, when the abdomen was opened there was an escape of gas, and in 4 there were feces in the abdominal cavity. In only 1 case was there more than one perforation. The ileum was the seat of perforation in all the cases. The perforation was closed by a purse-string suture of fine silk reinforced by one or two mattress sutures. It was impossible in 1 instance to close the perforation. Irrigation was used in only 1 case. In the others the exudate was thoroughly wiped away with gauze pads moistened in salt solution. Great care was taken to keep the intestines within the abdominal cavity during cleansing. Two patients eventually recovered. One lived a week and died from profuse toxemia; 1 died 1 hour; 1, 12 hours; 1, 22 hours; and 1, 63 hours after operation. In the 2 cases of suspected perforation in which operation was performed, there was a moderate grade of peritonitis in one which cleared up after the operation and the patient recovered

rapidly; in the second case the symptoms were evidently due to intestinal hemorrhage. The course of the disease was not affected by the operation and the patient died of hemorrhage and toxemia. In 11 cases there were conditions causing abdominal symptoms in which operation was not thought to be indicated. In 4 of these the symptoms were the result of abdominal distention and severe toxemia; in 1 they were explained by iliac thrombosis; in 1, by hemorrhage; in 1, most peculiarly by a termination by crisis; and in 2, by a neurotic condition.

An exhaustive article on **typhoid perforation** is contributed by C. E. Briggs.¹ The history and statistics are presented and the authorities on the subject freely quoted.

John C. Munro² deals with the **clinical diagnosis of typhoid perforation**, basing his remarks upon 26 cases, 21 of which he has seen at the Boston City Hospital in the past 4 years. There were 15 operations in cases with perforation, with 1 recovery. In 2 fatal cases the cause of the abdominal symptoms and of death could not be determined at operation. Two patients died and 3 recovered without operation. In 1 case of peritonitis from a ruptured mesenteric gland the patient died and 1 case of cholecystitis was fatal. One patient exhibiting a Widal reaction died from pyelitis and cystitis. In these 3 cases operation was performed for perforation. Munro is an ardent advocate of exploratory incision when there is any good reason to suspect perforation. It is a great mistake to expect a fall of temperature or an increase in pulse-rate in all cases of perforation. Muscular spasm, although difficult to estimate, is the keynote to the early detection of perforation in a large proportion of the cases. Cases with hemorrhage are the most perplexing. The majority of the cases here reported were explored under ether. So far as could be determined, the operations were done in 1 case 48 hours, in 2 cases 24 hours, in 1 case 18 hours, and in 2 cases 12 hours after perforation. In one case of operation within 4 hours there was probably a sudden, profuse gush of intestinal contents. In Thorndike's case of recovery the abdomen was opened within 6 hours after perforation. Regarding the cases operated upon in which there was no perforation, it is interesting to observe that the case with ruptured mesenteric glands gave typical symptoms of perforation. In 2 cases in which no perforation was found at operation no definite cause of death could be discovered at the autopsy. Both of these cases presented typical symptoms of peritonitis. In one of the cases of cholecystitis the possibility of perforation was considered only as remote. The patient with renal trouble could speak no English, was very ill, and a diagnosis was made on the association of abdominal symptoms with a Widal reaction. In the 2 cases which recovered without operation, Munro thinks that the perforation healed spontaneously.

A. W. Mayo Robson³ discusses the question of the **radical treatment of chronic intestinal tuberculosis** and makes suggestions for treatment in the more acute disease and in tuberculous peritonitis, and reports a

¹ Am. Jour. Med. Sci., May, 1903.

² Boston M. and S. Jour., Feb. 5, 1903.

³ Lancet, Sept. 27, 1902.

number of cases to illustrate his attitude. The first case was one of tuberculous appendicitis involving the cecum and a portion of the ileum and presented a stricture of the ileocecal valve. The patient had been once operated upon for appendicitis, but the appendix was not removed because of adhesions. Robson resected the cecum with a portion of the ileum and ascending colon. This patient a year after operation was greatly improved in health, but suffered from some abdominal pain suggestive of obstruction; it was not severe enough, however, to warrant an exploratory operation. Another case reported is one of multiple tuberculous strictures of the ileum, in which enterectomy was performed. A year later the patient was perfectly well. The third case reported is one of multiple tuberculous strictures of the ileum, in which a short-circuiting operation was done. It was intended that the patient should return later to have a portion of bowel excised, but her gain in health and the relief from the diarrhea made her hesitate to submit to another operation, and Robson thinks that it may not be necessary. The fourth case is one of stricture of the duodenum, probably of tuberculous origin, associated with tubercle of the stomach and stenosis of the pylorus. This patient was operated upon in 1895. The pylorus was opened with the idea of performing pyloroplasty. The duodenal stricture was dilated through the pyloric wound and pyloroplasty performed. The patient died in the second week from exhaustion. At the present time Robson would treat such a case by performing gastroenterostomy. The fifth case was one of tuberculosis of the cecum, in which a resection was done. This patient developed pleurisy some months after operation and died a year later. The last case was one of tuberculous disease of the rectum and sigmoid flexure of the colon, in which an excision was done. This patient's convalescence was slow, but he steadily gained strength. Attention is called to the frequency with which tuberculosis produces stricture of the bowel. In the first 4 cases here reported there was no difficulty in making a diagnosis of stricture, and from the length of time that the obstructive symptoms (constipation alternating with diarrhea) had existed it was supposed that the character of the stricture was non-malignant. It is thought that some cases of obstruction are put down as malignant which are really tuberculous. A second case of tuberculous appendicitis is also placed in this series. Robson has acted for many years on the principle that when a tuberculous area in the abdominal cavity can be removed, it should be removed. The success which has accompanied the carrying out of this principle tends to fortify it.

Crile¹ presents a preliminary note on the **diagnostic value of blood-pressure determinations in the diagnosis of typhoid perforation**, taking as a basis 5 cases of perforation in which blood-pressure determinations were made. In each of the cases the blood-pressure assumed the high level attending peritonitis from other causes.

The results obtained by operation in **typhoid perforation** are discussed by Depage,² and an interesting case in which recovery followed operation

¹ Jour. Am. Med. Assoc., May 9, 1903.

² Jour. de Chir. et Ann. de la Soc. Belge de Chir., Nov. and Dec., 1902.

is described. The patient was a woman, 42 years of age, who was operated upon 3 days after perforation. The abdomen was opened in the median line under cocain-anesthesia and a collection of fetid pus was evacuated. A small perforation was found in the ileum about 10 cm. from the cecum. A V-shaped resection of the bowel was done at the point of ulceration. The distention of the small intestine was relieved by needle punctures. Drainage was established and the patient made an uninterrupted recovery. Perforation in this case took place between the twelfth and the fifteenth day of the disease, and as the patient was not operated upon until 3 days later, the infection was general. This case illustrates the fact that, although a patient may be in an extremely grave condition from typhoid perforation, operation may save him.

Murphy¹ discusses the treatment of general suppurative peritonitis and reports a case of **typhoid perforation and 5 other consecutive cases of general suppurative peritonitis** in which the patients all recovered after a plan of treatment which it is now his custom to carry out. General suppurative peritonitis is not necessarily a fatal disease. The result depends upon the type of infection, whether of streptococic or staphylococic origin, for instance. A virulent streptococic infection produces rapid denudation of the endothelial covering of the peritoneum, rendering absorption very prompt. With the staphylococcus or colon bacillus infection this change takes place more slowly, and the patient may survive such infection for a number of days. Another feature which determines the result is the period of time which elapses between the infection and the time of operation. In times past the diagnosis of perforation was based on the condition of collapse, while at present it is more on the symptoms of pain, nausea, vomiting, localized tenderness, circumscribed flatness or piano percussion, elevation of temperature, and hyperleukocytosis. The tension under which the products of infection are retained in the peritoneal cavity is another question deserving serious consideration, since the greater the pressure under which the pus is retained in these acute conditions, the more rapid is the absorption. When the pressure is removed, absorption ceases, as after the opening and draining of an abscess. The diffusion of the infective material through the peritoneal cavity, the administration of antitoxins and other substances to antidote or dilute the poison, the length of time the patient is kept under the anesthetic, all influence the result. Murphy believes in general anesthesia, as so much time can be saved as to more than compensate for the dangers attending its use. Time is of the most vital importance in these operations. In all of the cases reported Murphy's method of operating was to open the abdomen quickly on the right side and without sponging or irrigation to introduce two large drainage-tubes, one into the pelvis and one into the right iliac fossa. The patient before, during, and after operation was kept in a semisitting posture in order to produce a gravitation of the fluid to the pelvis. Thorough stimulation was employed in all the cases, and antistreptococic serum was employed in some. In each of the cases reported,

¹ Jour. Am. Med. Assoc., April 11, 1903.

excepting the typhoid perforation, the source of the infection was the appendix, which was removed in each case. A point upon which Murphy lays great stress is that there is little or no depression immediately after the perforation of the intestine and no collapse. Collapse is a late manifestation and is the expression of the denudation of the peritoneum of its endothelial coat and absorption of infective material.

A second successful operation for perforation in typhoid fever is reported by Bowlby.¹ The patient was a boy, 10 years of age, who suffered a relapse in the third week; on the fourth day of the relapse he had a sudden fall of temperature and marked abdominal symptoms, with great pain and sweating. Operation was performed, it was thought, 2 hours after the perforation occurred. A considerable quantity of almost clear fluid was found in the abdominal cavity with a small collection of fecal matter. The whole small intestine was greatly distended. The perforation, the size of the head of a pin, was found about 2 feet from the cecum. The ulcerating area was inverted with Lembert sutures of silk. The abdominal cavity was given a dry toilet, a drainage-tube introduced, and the wound partially closed. The patient was quite sick after the operation, but recovered. A number of months after the operation the boy was in excellent health. This case and another already published constitute Bowlby's experience in operations for typhoid perforation, and both have been successful. His success in both these cases he largely attributes to the fact that in each the perforation occurred after the fever was practically over and when the general condition of each patient was relatively good. Bowlby closes with the suggestion that in all cases in which perforation is suspected a surgeon should be called in as promptly as possible.

Pettus,² of the United States Marine-Hospital Service, describes a successful late operation for **gunshot wound of the intestines**. A 32-caliber bullet entered in the median line just over the pubic arch. The patient walked about after the receipt of the injury and presented no shock and complained of no pain or nausea. A catheter introduced into the bladder brought away clear urine. The wound was explored and it was found that the bullet had injured the pubic arch, but there was no evidence of its entrance into the peritoneal cavity. It was thought advisable, under the circumstances, not to open the abdomen. The patient did well for 24 hours, when his condition grew rapidly worse, there being every evidence of peritonitis. Thirty-one hours after the receipt of the injury the abdomen was opened and was found to contain a quantity of bloody, flocculent serum and fecal matter. Seven ragged perforations of the small intestine were found and closed. As closing these wounds in the longitudinal direction would have seriously impaired the caliber of the bowel, Pettus sutured them transversely. In one wound, if this had not been done a resection of the bowel would have been necessary. A piece of the patient's trousers was found adherent to the intestines near one of the perforations. The abdominal cavity was thoroughly irrigated with normal salt solution until perfectly clean.

¹ Lancet, Jan. 10, 1903.

² N. Y. Med. Jour., Aug. 30, 1902.

Drainage was introduced through the pelvis and the wound closed. The patient's condition during the latter part of the operation was very bad, but he quickly rallied and made an uneventful recovery. The large wounds of the intestine in this case were probably due to the flattening of the bullet against the pelvic bone. The result in this case goes to disprove the statement of so many authorities that operations performed after 24 hours for gunshot wounds of the intestines are useless.

Vance,¹ of Louisville, reports 3 consecutive and successful operations for **gunshot wound of the abdomen**. The first case was one in which there were 4 intestinal perforations and an injury of the mesentery. The patient made an uncomplicated recovery. The second case was one in which the stomach and duodenum were perforated. This patient was operated upon within 40 minutes after the receipt of the injury. But one wound of the stomach could be found,—that in the anterior wall,—and but one wound of the duodenum, a very oblique one. It is evident that the ball entered the stomach, passed through the pylorus, and injured the duodenum in its exit. The peritoneal covering of the duodenum was injured for quite a distance. After suturing the duodenal wound a flap of the lesser omentum was fixed over it. The patient returned to his home perfectly well on the fifteenth day after the operation. The third case was that of a boy 13 years of age who was seen a number of hours after the receipt of a gunshot wound of the abdomen. He was suffering from great shock, due to loss of blood, and at the time of operation exhibited all the symptoms of profuse hemorrhage. Operation in this case seemed almost hopeless; nevertheless, it was undertaken. There was a large wound of the stomach where the bullet had evidently cut out a section of the anterior wall. There was also a buttonhole through the left lobe of the liver, which, however, was not bleeding. About 3 feet from the cecum there were 3 wounds of entrance and 3 of exit in the ileum; also 2 wounds of the mesentery dividing large mesenteric vessels, which bled profusely. All of the wounds were repaired and the abdomen was irrigated and drained. He ultimately recovered. Vance is impressed with the necessity in these cases of operating at the earliest possible moment. In this connection, also, he reports a stab-wound of the abdomen in which the ileum presented a very extensive wound nearly severing the bowel, and also a wound of the mesentery. After the control of the bleeding from these wounds blood continued to come from the neighborhood of the spleen, which had evidently also been injured. Gauze packing controlled this, however, and the abdomen was closed. The patient recovered.

Six cases of rupture of the intestine with 4 recoveries are reported by Lund, Nicholls, and Bottomley,² of Boston. The first 3 cases in the series were operated upon by Lund. In the first case the small intestine was torn from its mesentery for about 3 inches, and in the center of the bowel, which was denuded of its peritoneum, there was a large perforation. This patient received his injury from a fall from a bridge. He was operated upon 24 hours after the receipt of the injury

¹ N. Y. Med. Jour., July 26, 1902.

² Boston M. and S. Jour., Nov. 27, 1902.

and soon after his admission to the hospital. The damaged bowel was quickly excised and an anastomosis was made with a Murphy button. The patient died 2½ hours after the operation. The second case was one of rupture of the small intestine due to the kick of a horse. Operation in this case was performed 16 hours after the accident, and the patient recovered. The rupture in this case was about the size of a lead-pencil and was partly closed by the pouting of the mucous membrane through it. The third case was also one of rupture of the small intestine due to the kick of a horse. The operation in this case was done 9 hours after the injury, and the patient recovered. The fourth case, operated upon by Nicholls, was one of rupture of the ileum due to the kick of a horse. Operation was done 3 hours after the injury, and the patient recovered. The fifth case, operation by Bottomley, presented all the signs of diffuse general peritonitis and showed a perforation in the jejunum opposite the mesenteric attachment. This patient died 72 hours after operation. The interesting feature, and the one which makes the case unusual, is that neither from the patient's story nor from that of the witnesses, nor from external sign, could any evidence be obtained of direct contusion of the anterior abdominal wall. The patient was knocked down upon a flat surface by being struck on the back just below the shoulder-blade by the shaft of an approaching patrol wagon. The sixth case, also operated upon by Bottomley, and which recovered, was that of a boy 8 years of age, who was run over by a wagon. The rupture in this case was at about the mid-point of the ileum, 1 inch from its attachment to the mesentery. The mucous membrane was pouting through the everted edges of the opening and had prevented the escape of much fecal matter. It is stated that the one thing which means most to both surgeon and patient in these cases is the length of time which is allowed to elapse from the hour of accident to the hour of operation. Beyond the fourth or fifth hour every additional moment of delay adds greatly to the danger of a fatal issue.

An instructive case of laceration of the bowel without external evidence of injury is reported by Claybrook.¹ The patient, a muscular young man, was caught between the bumpers of cars. After the injury he walked 50 yards and was then put upon a stretcher. He was slightly pale and complained of pain in the abdomen. There was no vomiting and no shock, the pulse-rate being 72. There was no bruise or abrasion of the skin of the abdomen, but the abdominal muscles were very rigid and tenderness was marked. On examination with the stethoscope there was complete arrest of peristalsis and the heart and respiratory sounds could be easily heard as low down as the hypogastrium. A diagnosis of rupture of the alimentary tract was made and operation was immediately performed. When the abdomen was opened, a large quantity of blood escaped. An examination of the abdominal contents showed the small intestine completely severed at the duodenojejunal junction and the mesentery at this point torn through to the base. The hemorrhage came from torn mesenteric vessels. The bowel was anastomosed by

¹ Virginia Med. Semi-Monthly, June 12, 1903.

means of sutures, the abdominal cavity thoroughly flushed out and closed without drainage. The patient made an uneventful recovery and 2 months later resumed his duties as a brakeman. In addition to pain, tenderness, and rigidity, together with thoracic respiration, Claybrook believes the complete absence of peristalsis as revealed by the phonendoscope, and the transmission of the heart and respiratory sounds so as to be audible over the whole abdomen, to be of the greatest diagnostic value. The presence or absence of shock cannot be relied upon, as it is often absent in the worst cases until sufficient hemorrhage has occurred to produce it, and, on the contrary, it is at times profound after a simple contusion of the abdominal wall.

Brewer¹ reports 9 cases illustrating **some important points in the diagnosis and treatment of abdominal contusions associated with visceral injuries.** He states that "pain, tenderness, and muscular rigidity are often the only symptoms during the first few hours after the receipt of the injury, and the occurrence of these three symptoms following an abdominal traumatism should be regarded as a positive indication for an exploratory laparotomy. To delay exploration for the occurrence of other more characteristic and localized symptoms is but to invite disaster, as the resistance of the individual after the receipt of the severe visceral injury diminishes with every hour of delay, and the only hope of his being able to withstand the added shock of a severe surgical operation is to inaugurate the treatment at the earliest possible moment." If the presence of free gas or fluid in the peritoneal cavity can be determined, the indication for exploration is all the more imperative. Brewer recommends treatment of extensive lacerations of the spleen by pressure and gauze packing rather than by splenectomy. He believes that it is equally as effective in arresting hemorrhage; it is accompanied by less shock; it saves time and preserves an important organ. [We are in accord with the opinion here expressed, believing that the spleen is sometimes sacrificed because of the ease with which it can be removed. In some cases the simple method of packing will suffice.] Attention is called to the fact that even after the severest lesions surprisingly slight shock may be present during the first few hours, and we must not judge of the gravity of the injury by the degree of the initial shock. Success in operating upon these cases will depend upon speedy work, perfection of technic, and ability to administer at any moment the most vigorous stimulation. Brewer observed in several cases accompanied by severe intraperitoneal hemorrhage, exhibiting comparatively slight evidences of shock, that as soon as the peritoneum was incised and the intraabdominal pressure was relieved, the patient passed rapidly into a state of profound collapse. He therefore advises the exposure of one of the large veins of the arm before the abdomen is opened in order that a saline infusion may be promptly employed.

A. Neumann² reports a case of **rupture of duodenum** resulting from contusion of the abdomen. The patient was a man who fell 16 feet, striking his abdomen upon the top of a barrel. Operation was performed

¹ Ann. of Surg., Feb., 1903.

² Deut. Zeit. f. Chir., Bd. lxiv, No. 7, 1902.

6 hours after the injury and the perforation of the bowel was closed by sutures. The patient suffered from severe peritonitis after the operation, but finally recovered. The author presents a review of all the cases of contusion of the abdomen occurring during the past 20 years in the service of Hahn at Friedrichshain. During this period 133 cases of contusion of the abdomen were treated and 61 presented some serious visceral injury, the intestine being the one most frequently involved (21 cases). If sufficient interval of time elapses between the inauguration of the force and the impact to allow of contraction of the abdominal muscles, the chance of visceral injury is greatly decreased. Usually the intestine is crushed or torn from its mesenteric attachment. There are no symptoms which point absolutely to intestinal perforation. Shock is a most variable symptom. The most characteristic sign is absolute rigidity of the abdominal wall. The case reported by Neumann is the only one occurring in this series which recovered after operation. In order to be successful, operation must be performed early.

Robert G. Le Conte¹ takes for the subject of his annual address on surgery delivered before the Philadelphia Academy of Surgery, the **diagnosis of intestinal injury following abdominal contusion**. Dealing thoroughly with the subject and illustrating his remarks with numerous results of cases, he concludes: (1) That a moderately assured diagnosis of grave injury must be made before operation is undertaken, or we will open many abdomens to find the trauma confined to the abdominal wall. In a series of 100 consecutive cases of abdominal contusion as they enter a general hospital, perhaps 30 or 40 will have received a grave injury demanding operation, while the other 60 or 70 recover without any operative procedure. For the sake of argument, the author is willing to grant that if the abdomen is immediately opened in each one of the 100 cases there will result a smaller percentage of deaths than if the surgeon waits for some other symptoms of intestinal damage. But can we call such radical and empirical treatment the science of surgery? The author states that if he were one who always, without exception, advocated immediate operation in appendicitis as soon as the diagnosis is made, he could with greater force urge immediate operation in all cases of abdominal contusion, for the seriousness of the two conditions is scarcely comparable in his opinion. The teaching of many of the modern writers when they urge operation in all cases presenting pain, rigidity, and local tenderness seems too radical, for we have various kinds of pain and tenderness, and different degrees of rigidity, and many times these symptoms are due to injury of the abdominal wall alone. Had he followed such teaching, he should have opened the abdomen in 6 cases here reported, for each of them presented pain, localized tenderness, and rigidity, and yet they all recovered without an exploratory operation. He believes, then, that we should wait for some symptom or symptoms indicative of intestinal injury. (2) In the presence of shock a diagnosis of intestinal injury cannot be made, no matter how profound the shock may be or how slowly reaction takes place. We may diagnose hemor-

¹ Ann. of Surg., April, 1903.

rhage, which would lead to an immediate operation, and at the same time presume the presence of a lacerated gut, but primary shock is of itself no aid to our diagnosis. Therefore we should wait for reaction to take place. (3) No one symptom is pathognomonic of intestinal injury, but the two most reliable are gradually increasing rigidity and facial expression. In the next group are placed deep and perhaps radiating abdominal pain, respiration which becomes more and more thoracic, vomiting after the shock has ceased; distention, increasing pulse-rate, and secondary fall in temperature. The order in which they are mentioned has no significance, for any one or two of these symptoms may be prominent to the exclusion of the others. (4) Any individual who has received an abdominal contusion sufficiently severe to call for medical services demands also the most careful and constant watching in order that the surgeon may detect at the earliest possible moment the appearance of grave symptoms. It is not meant that we should wait for these symptoms to become so pronounced that a positive diagnosis is assured, for then operation is for the most part too late. There is a position, however, midway between operating on every case and waiting for an assured diagnosis, where we can say that, owing to the gradual appearance of certain symptoms, we have fair reasons to think the intestinal tract may be injured, and that under such circumstances an immediate operation will give the patient the best chance. In such a case it must not be forgotten that perforation may take place hours or even days after the injury. Lastly, as our individual experience increases, we gain the power to place a more just value upon the symptoms present and to perceive the grave symptoms in their early stages. In other words, we gain in acuteness of perception, and there is scarcely any injury to the body which requires this more for a successful result.

Three cases of **rupture of the intestine without severe external injury** are reported by Törnqvist.¹ The first case is that of a man 20 years of age, whose jejunum was ruptured by a kick of a horse. The patient was operated on 11 hours after the injury and death occurred from general peritonitis 7 days later. In the second case, that of a man 25 years of age, who had been kicked by a horse, the operation was performed 6 hours after the receipt of the injury, and a rupture of the jejunum found. This patient recovered. The third case is that of a boy of 16 in whom the lower part of the ileum was ruptured by a blow on the abdomen from a stone about the size of a fist. This patient was operated upon about 8 hours after injury and made a good recovery. The following symptoms are considered characteristic of a ruptured intestine: (1) The rapid rise in pulse-rate occurring immediately after the injury and steadily increasing. This is especially important in the absence of other symptoms, indicating intraabdominal hemorrhage. (2) The rapidity with which the general condition of the patient grows worse. (3) The increasing zone of dulness in the region of the injury. (4) Rigidity of the abdominal wall and the appearance of pain and ten-

¹ Nordiskt Medicinskt Arkiv, 1902, vol. xxxv, Hef 1, No. 2; Amer. Med., Nov. 22, 1902.

derness. In the treatment of these injuries Törnqvist advocates immediate celiotomy with cleansing of the peritoneal cavity by sponging and the use of free drainage.

Ager¹ discusses the case of a man aged 36 years who entered the hospital, giving the history of diarrhea for a week, which had been checked by a cholera mixture. The night previous to admission he had taken a dose of castor oil. He rapidly grew worse after admission, and developed symptoms of appendicitis. An operation was decided upon. At the time the patient's temperature was 104° and pulse 106. A congested appendix was removed, and, although there was evidence of **intestinal perforation**, the patient's condition prevented further search for the cause of the trouble, and the operation was hastily completed. The patient died 12 hours later, and an autopsy revealed general peritonitis with adherent small intestine. When the adhesions were separated, a living lumbricoid was found. Later a small round perforation was found in the small intestine, about 10 inches from the cecum. The mucous membrane at the point seemed healthy except for the clean-cut perforation.

A contribution to the study of intraabdominal omental torsion is presented by J. F. Baldwin,² who reports 2 interesting cases in this connection and discusses the predisposing causes of intraabdominal torsion. If the pedicle is so situated as to furnish a perpendicular axis for rotation, torsion will be more apt to occur. If a perpendicular axis is afforded by the pedicle proper and also by an adhesion at the bottom, torsion will be still more apt to take place. That a congenital malformation may give rise to such a pedicle is shown possibly by Wiener's case, and quite positively by the author's. It is by no means necessary to the production of torsion that the pedicle should be particularly small. "In the 6 cases reported by Wiener, the diagnosis in 4 was simply that of strangulated hernia. In one of the others the symptoms led to a diagnosis of appendicitis, and in his own to that of an intraperitoneal abscess. In Baldwin's case the diagnosis of a mild but progressive appendicitis seemed clearly warranted. In all the cases the gravity of the symptoms was recognized and prompt operation resorted to." In the author's first case operation was done for an ill-defined mass which could be felt in the right inguinal canal and extending down to the bottom of the scrotum. On opening the hernial sac, which extended to the testicle, a small piece of omentum was found occupying the sac, but adherent only to the bottom. This adhesion was separated, and on pulling down the omentum a mass soon appeared, which was drawn out with considerable difficulty. It proved to be an omental tumor 5 or 6 inches long and more than an inch in diameter, with a smooth exterior, and looking not unlike a piece of bowel. On bringing it out, it was found connected with the rest of the omentum by quite a narrow pedicle. This pedicle was ligated and the tumor removed. On examining the specimen, it was found that after separating a few adhesions which kept it in shape, the mass could be spread out into quite a normal-looking piece of omen-

¹ Jour. Am. Med. Assoc., Feb. 28, 1903.

² Ann. of Surg., Dec., 1902.

tum. From the history and appearance there could be no question that this mass had from time to time occupied the hernial sac, but that reduction, while complete so far as the mass was concerned, was incomplete, owing to the adhesion of the strip of omentum to the bottom of the sac. This case does not represent one of torsion of an omental tumor, but throws some light upon the formation of such masses. The second case reported is that of a man, 47 years of age, who was operated upon for mild but progressive appendicitis, there being little doubt as to the diagnosis. Abdominal tenderness and rigidity were both prominent. When the abdomen was opened, a mass was encountered and withdrawn through the abdominal wound, which proved to be made up of omentum rolled up so as to make a distinct tumor and having a very small pedicle, not larger than a knitting-needle, twisted upon itself eight times. The entire mass was about the size of a large fig. The pedicle was ligated and the tumor removed. The appendix was then more carefully examined and its distal portion found obliterated. Examination of the specimen showed it to be made up of ordinary omentum, but rolled together and adherent so as to make a distinct tumor. When the adhesions were separated it could be spread out and then just about covered the palm of the hand.

Von Mikulicz¹ presented to the American Surgical Society what he called small contributions to the **surgery of the intestinal tract**. He first discussed briefly **cardiospasm and its treatment**. Cardiospasm is a term the author has applied to a dilation of the lower portion of the esophagus which results from occlusion of the cardiac orifice of the stomach due to muscular spasm, and which is characterized by difficulty in swallowing either liquid or solid food, until in the last stages only a very small amount of food can reach the stomach. Since employing the esophagoscope von Mikulicz has observed 20 cases. This affection can only be definitely diagnosed by means of the esophagoscope. In many of the cases carcinoma of the cardiac orifice will be suspected. The author presented skiagraphs showing the value of the *x*-ray in diagnosing the condition. A primary cardiospasm is spoken of in which no other condition is demonstrable, and a secondary cardiospasm which has occasionally been observed in cases of carcinoma of the cardiac end of the stomach. Two cases out of 14 of primary cardiospasm were followed by secondary malignant growth. In each case the growth was found in the esophagus above the dilation. In regard to the treatment of cardiospasm, washing of the esophagus to remove the decomposing residue can only relieve the inflammation. In the severe cases patients must be fed through a stomach-tube. This can be easily done, as the patient soon learns to pass the tube. If this method fails, a gastric fistula must be established. The author has tried many methods of dilating the cardiac orifice. In one very bad case he opened the stomach and stretched the cardiac opening thoroughly. Three months have elapsed since this operation, but the patient is still thoroughly comfortable and able to take solid food. A second topic presented is that of **peptic**

¹ Boston M. and S. Jour., June 4, 1903.

ulcer of the jejunum. This is a condition which has been observed only as a sequel to gastroenterostomy. Fifteen such cases have been encountered by the German surgeons. According to the experience of these men, the ulceration occurs only after anterior gastroenterostomy performed by the Wölfler method, and when the operation is performed for benign affections of the stomach, such as gastric ulcer or pyloric stenosis. It does not follow the posterior gastroenterostomy of von Hacker. The general picture of the disease closely resembles that of gastric ulcer, hence most cases were formerly regarded as a recurrence of the original trouble. Pain is a prominent symptom. Resection of the bowel has been performed in a few cases, but there is a strong tendency to renewed ulceration. In one of his own cases von Mikulicz states that after resection a new ulcer formed 10 cm. from the site of the first. He reports a case also of anterior gastroenterostomy performed for congenital pyloric stenosis in a child 3 months of age, in which 2 months after operation there developed multiple jejunal ulcers which caused death through profuse intestinal hemorrhage and peritonitis. The development of jejunal ulcers can be explained only by the prolonged presence of gastric juice which reaches the jejunum without having been diluted and neutralized by bile and pancreatic secretion. One of the lessons to be drawn from the facts stated is that surgeons should no longer perform anterior gastroenterostomy, at least not for benign affections of the stomach. The third part of the author's paper has to do with the **operative treatment of severe forms of invagination of the intestine.** He reports an interesting case of invagination of the ileum, cecum, and colon in which the cecum was protruded from the anus. In this case a portion of the intussusception was brought through an abdominal wound and carefully sutured to its edges. A long incision was then made through the outer bowel to the intussusceptum, which consisted of two tubes of intestine, one contained within the other, the outer being colon, the inner, ileum. The outer and inner layers of the intussusceptum were cut away step by step and deep catgut sutures were immediately put in to close the peritoneal pocket as soon as it was open. This patient recovered. The same method was employed with equal success in the second case. The latter portion of this valuable contribution deals with the **operative treatment of malignant growths of the large intestine.** Because of the large mortality from peritonitis which follows primary resection of the large intestine from malignant growths, von Mikulicz has for a long time advocated the two-stage operation. The results of this method are infinitely better than those following primary resection. Of 24 cases operated upon, but 4 died after the operation, and none of these deaths can be attributed to the method of procedure, one having died 11 days after operation, from pulmonary embolism; another, a week after, of pneumonia; a third, 6 weeks after operation, of general carcinomatosis; and a fourth, within 2 days, of peritonitis. The primary operation consists in the enucleation of the tumor, the removal of the lymphatic glands, and the withdrawal of the mass through the wound. The loop of bowel is stitched to the parietal peritoneum and the abdominal wound is partially closed. When the abdominal cavity is com-

pletely shut off, the tumor is excised and an artificial anus is established which is closed 3 or 4 weeks later.

F. Gregory Connell¹ discusses **through-and-through intestinal sutures** at some length, quotes numerous authorities, and reports a number of additional cases operated upon. His conclusions are as follows: "(1) The suture that aims to include but a portion of the bowel-wall is dangerous: (a) because it is liable to fail to include any of the submucosa, in consequence leaving a weak stitch; (b) because, if including any of the submucosa, it is almost certain to penetrate the coat, leaving a stitch open to the dangers of capillarity. (2) By utilizing a through-and-through suture the danger of yielding is excluded. (3) By employing a suture that is knotted in the lumen the danger of capillarity is diminished. (4) It is acknowledged that the most appropriate place for the knot when all coats are perforated is in the lumen of the bowel. (5) It is undeniable that when the submucosa has been perforated accidentally the knot ought to be placed inside. (6) It is also undeniable that many so-called Lembert stitches perforate the submucous coat, and thus convert an intentional nonperforating into an unintentional perforating suture. (7) Undeniable, too, that owing to the extreme tenuity of the submucous coat (one-sixth of the thickness of the needle which is to 'penetrate, but not perforate' it) we are utterly unable to differentiate between a perforating and nonperforating Lembert stitch. (8) The logical conclusion is that the ideal location for the last and all knots in an enterorrhaphy is outside of the peritoneal cavity, in the lumen of the bowel. (9) As a chain is no stronger than its weakest link, it is of practical import that the last one or two stitches be also perforating and knotted in the lumen. (10) The diaphragm by its valve-like action is of great value in the prevention of leakage. (11) The tying of the knot, according to the method described above, does not interfere with the establishment of firm union or tend to leakage. (12) The side-knot, or 'square' stitch, in rendering a retaining suture unnecessary, is superior to the top-knot, or 'circular' stitch."

James H. Dunn² reports **16 cases of intestinal resection**, in 9 of which a Murphy button was used and in 7 of which simple sutures were employed. Of the 9 cases in which the button was used, 3 were fatal, 1 clearly because no resection should have been undertaken. In one the larger button was used in an end-to-end anastomosis of the sigmoid, and although the patient was *in extremis*, it is quite possible that he might have recovered if the suture had been used. This is the only case in which the author has to regret the method of anastomosis chosen. One patient died 6 weeks after operation, with extraperitoneal suppuration in the abdomen and nephritis. There is no reason to believe the method of anastomosis had anything to do with the result. Of the 7 cases in which suture alone was employed, 6 recovered and 1 died from collapse within an hour. Four of these 7 anastomoses were done with the Connell suture. The author's conclusions are as follows: (1) Suture is the most indispensable and generally applicable method of anastomosis in

¹ Amer. Med., Jan. 24, 1903.

² Jour. Am. Med. Assoc., May 20, 1903.

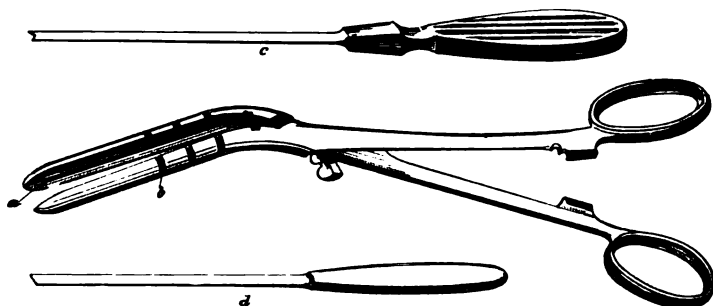


Fig. 26.—Lundholm's forceps for intestinal anastomosis. *a*, Longitudinal grooves on inner surfaces of the blades, forming a rectangular tunnel closed at one end, when forceps are locked; *b*, transverse grooves extending around outer surfaces of both blades; *c*, sharp-pointed sliding stylet, to be introduced into the tunnel formed by the grooves in order to cut the intervening visceral wall; *d*, blunt sliding stylet to be heated and introduced into the tunnel after cutting is done, thereby preventing eventual hemorrhage (Jour. Am. Med. Assoc., Sept. 27, 1902).

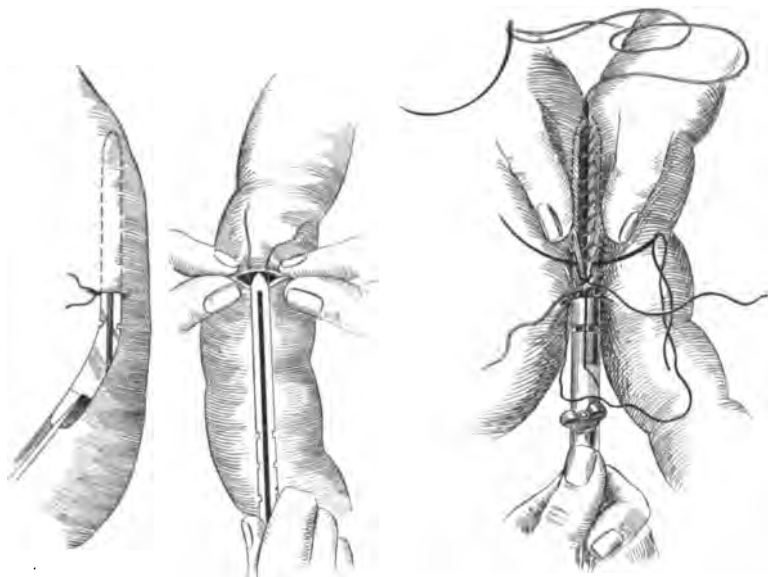


Fig. 27.—Lundholm's method of intestinal anastomosis, showing first steps of operation. One blade of forceps has pierced gastric wall and is held securely in position by tightening and tying the puckering ligatures in one of the transverse grooves. This also protects from possible leakage of stomach-contents. The other blade, in the operator's right hand, is held ready to be pushed through into the lumen of the intestine in the center of the pucker. In order to guard against accidental penetration of both intestinal walls, the anterior wall is held up steady by thumb and index-finger of operator's left hand (to the left on the figure), and also in the same manner to the right by an assistant (Jour. Am. Med. Assoc., Sept. 27, 1902).

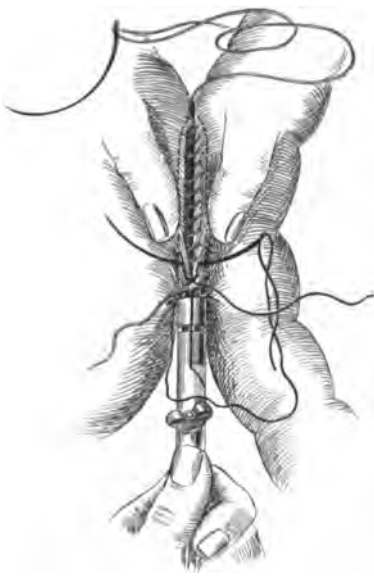


Fig. 28.—Lundholm's method of intestinal anastomosis. Shows the upper side of the forceps after it has been introduced and locked. The two blades of the instrument hold the gastric and intestinal walls in juxtaposition, pressing them firmly together. The original puckers are seen tied around the blades. A continuous silk suture (white) going through all the layers and also a superficial catgut (black) are sewed over the upper surface of the instrument. Note that the ends of both silk and catgut sutures are left long to be tied with the other ends of the same sutures when suturing is completed all around the anastomosis and instrument removed. The forceps are held by an assistant and the fingers of the operator's left hand are holding the parts to be sutured somewhat tense over the instrument, thus very materially aiding the placing of the sutures (Jour. Am. Med. Assoc., Sept. 27, 1902).

intestinal resection. (2) The Murphy button is equally useful, if not preferable, under certain conditions, but very inferior under others. For the end-to-end union of segments of normal small intestine, or the end-to-side anastomosis of healthy small and large bowel, it gives results unexcelled by any other method. In unions of the larger intestine it is so far inferior to suture as to be practically contraindicated. Pathologic changes in the small intestine or its mesentery which render the perfect application of the button difficult or such as would probably disturb the course of

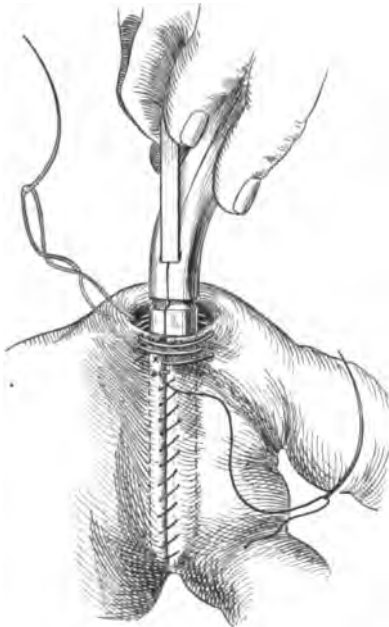


Fig. 29.—Lundholm's method of intestinal anastomosis. Represents underside of the instrument. The silk suturing is completed to the point X, where it is tied, but not cut, after which three loose stitches are placed around the instrument, ending at the starting-point. The catgut suture is completed to the point *, where it is also tied and left long. The sharp-pointed stylet is pushed into the tube formed by the two longitudinal grooves in the blades, thereby severing the inter-medial visceral walls and also the two purse-string ligatures which were placed primarily around each blade (Jour. Am. Med. Assoc., Sept. 27, 1902).

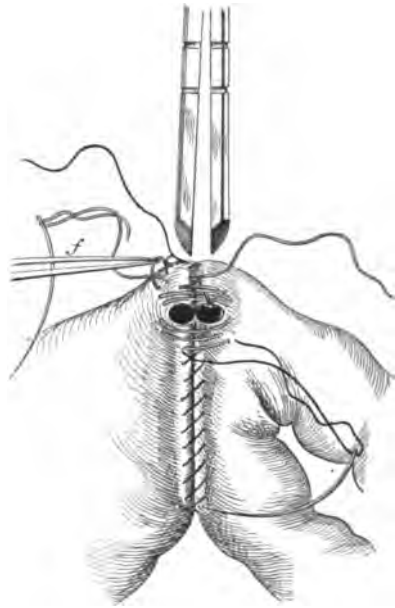


Fig. 30.—Lundholm's method of intestinal anastomosis. The instrument is removed. The primary puckers around each blade of the instrument, which were cut by the sharp-pointed stylet, are picked up by a dissecting forceps, *f*. The edges of perforation produced by the instrument are to be inverted, the stitches already placed tightened, and the two ends of the silk suture tied together (Jour. Am. Med. Assoc., Sept. 27, 1902).

healing, should be united by suture. (3) Of suture methods, that of F. Gregory Connell is incomparably the best; is, in reality, the simplest; a single row of continuous suture, all within the gut, the most likely to be even, strong, and tight, with the smallest and most even diaphragm, admits of the easiest and most perfect dealing with the mesenteric border and is capable of a simple invariable technic. (4) It is especially desirable to choose the fewest and simplest means compatible with the best work, because intestinal operations occur at rare and irregular intervals

as emergencies in the hands of many surgeons, and the little conveniences which enter into highly specialized operations of repeated daily execution are for the most part worse than impracticable."

Lundholm¹ describes a new instrument for **intestinal anastomosis** the use of which is easily understood by reference to the illustrations (Figs. 26-32). He has employed the instrument in 6 cases, 5 of which were gastroenterostomies and 1 a lateral anastomosis of the intestine. In 4 of the stomach cases an enteroanastomosis was also made. All of the patients recovered. The author's conclusions are as follows: "Any kind of lateral anastomosis is rapidly performed, about $\frac{1}{2}$ hour being generally sufficient. The size of the anastomosis opening can be made larger or smaller, as the need may be, by pushing the blades more or less

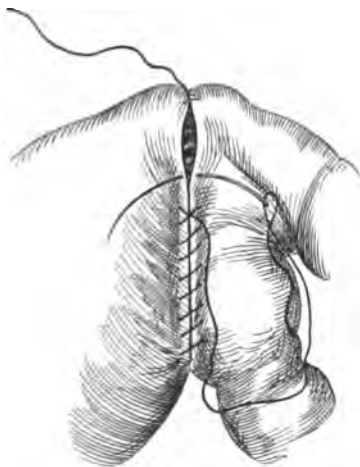


Fig. 31.—Lundholm's method of intestinal anastomosis, showing the silk suturing completed. The last two or three catgut stitches are then finished and the two ends of the catgut tied together (Jour. Am. Med. Assoc., Sept. 27, 1902).

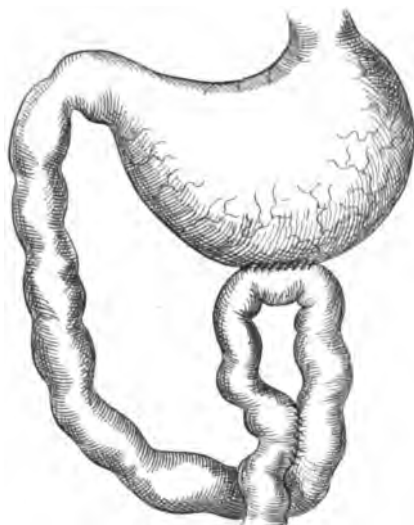


Fig. 32.—Lundholm's method of intestinal anastomosis. The anastomosis completed. The intestinal anastomosis is performed in exactly the same manner as gastro-enterostomy (Jour. Am. Med. Assoc., Sept. 27, 1902).

deeply into the bowel before the forceps are locked. Leakage of visceral contents during the operation is, with ordinary care, nearly impossible. With the instrument in the bowel the sewing can be done with ease very rapidly and substantially. It leaves no foreign body in the bowel to be expelled afterward. A surgeon with limited experience in intestinal work can, with this instrument, perform lateral anastomosis with comparative safety. Postoperative hemorrhage from the stomach is prevented by crushing of the tissues with the forceps, by the suturing and the cauterization of the cut edges. No hemorrhage has so far occurred in any of my cases."

A case in which nearly 8 feet of gangrenous intestine was resected

¹ Jour. Am. Med. Assoc., Sept. 27, 1902.

is reported by George R. Harris.¹ The patient was suffering from general peritonitis at the time of operation. Gangrenous intestine resulted from constriction by a band. The mesentery as well as the bowel was necrotic at several points. There was a small perforation in one part of the intestine. The gangrenous portions of both intestine and mesentery were removed and an anastomosis was made between the cecum and the distal end of the small intestine. The patient vomited persistently after the operation for some time, but this symptom was greatly relieved by gastric lavage. The Murphy button with which the anastomosis was made was found in the rectum on the twenty-fourth day and removed. Except for the fact that the abdominal wound became infected, the patient made a good recovery. A list of 35 cases in which great lengths of intestine have been resected accompanies the report.

Roswell Park² reports a case of **successful removal of 265 cm. of gangrenous intestine**. The case was one of gangrenous appendicitis involving in the gangrenous process a large portion of the small intestine and cecum. The inflamed bowel was adherent to the cecum and appendix. There were four large areas of bowel-wall which were in a gangrenous condition and threatened perforation. The uppermost point of this kind was a great distance from the cecum. After the adhesions were separated the question presented itself whether it was best to do several resections or to take out the entire diseased bowel and make one anastomosis. The latter course was decided upon, the ileum being anastomosed by means of the Murphy button with the ascending colon. The remaining ileum and a large portion of the cecum were excised and their ends inverted. The patient was very septic at the time of operation, but, except for a fecal fistula which discharged for 3 or 4 months and then closed, he made a good recovery. The button was not passed until 4 months after operation, and it was then that the fecal fistula closed. The patient was recently heard from and was in the best of health in every respect. The bowel removed measured 265 cm. (8 ft. 9 in.). Park presents a list of 16 cases besides his own in which more than 200 cm. of bowel has been removed. In a case of Obalinski the bowel removed measured 365 cm. (12 ft. 2 in.). This patient died promptly after the operation. Of the patients, 15 recovered although from 205 cm. (6 ft. 10 in.) to 320 cm. (11 ft.) was excised.

Emanuel J. Senn³ presents an **experimental and clinical study relating to the transplantation of the omentum in operative treatment of intestinal defects**, with the following conclusions: (1) Transplantation of omentum over defects in the stomach is an established operation. (2) Transplantation of omentum over intestinal defects is recommended, but is still in the developmental stage. (3) Transplantation of omentum over defects in the cecum gives better results than in any other portion of the intestinal tract. (4) Transplantation of omentum over defects in the small intestine should only be done after

¹ Med. Rec., Oct. 11, 1902.

² Buffalo Med. Jour., April, 1903.

³ Jour. Am. Med. Assoc., April 18, 1903.

fixation of the segment of intestine to the abdominal wall. (5) Gauze drainage should be resorted to, excluding the general peritoneal cavity.

Pollard¹ reports an unusual and interesting **case of matting of the intestines** for which he performed a **successful double enterectomy**. A large amount of the small intestine was matted together and firmly adherent to the sigmoid. It was necessary to remove the whole mass of the small intestine, measuring about 3 feet, and a number of inches of the sigmoid flexure. An end-to-end anastomosis by means of sutures was employed in each instance. The patient made a good recovery.

The creation of an **artificial valvular fistula in the cecum for the treatment of chronic colitis** and a **similar opening in the jejunum as an adjunct to certain operations on the stomach** is described by C. L. Gibson,² who refers to the cases operated upon by Bolton,³ and also the method of employing the appendix for irrigating the colon, as suggested by Weir. In a case in which Gibson operated, the patient lived only 8 days, dying of tuberculous enterocolitis. Although the irrigation was begun through a misinterpretation of directions on the first day after operation, it was carried out without infection of the peritoneal cavity, as the autopsy showed. The operation which Gibson recommends is exactly that which Kader uses in performing gastrostomy. The second portion of this paper deals with performing jejunostomy after the same manner in certain cases of operation upon the stomach. This is done in order to enable the patient to receive nourishment at once without any disturbance of the stomach. The suggestion of this operation is only tentative, its application being limited and its results, immediate and remote, debatable. Gibson reports a case in which he removed a large part of the stomach, anastomosing the duodenum and remaining portion, bringing up a loop of the jejunum, and establishing an opening into it such as described. This patient, however, died on the third day, from peritonitis starting in the lesser peritoneal cavity, evidently due to infection during the operation, the suture lines of the anastomosis being found in excellent condition. There had been no leakage around the jejunal opening. The advantage of using the method of Kader is that the opening will close in a few days if the tube is withdrawn.

Robert F. Weir,⁴ in advising the establishment of artificial anus at the cecum or ascending portion of the colon in cases of **persistent and intractable colitis** for the purpose of thorough irrigation of the bowel, refers to a case in which he brought the appendix into the wound and after fastening it there opened its extremity and introduced a catheter through it into the cecum. Irrigation through the appendix in this case resulted in recovery. If only we are sure that the appendix is patent, it need not be opened until adhesions have formed. The advantage of the method is its simplicity and the ease with which the appendix can be removed and the fistula closed.

Willy Meyer⁵ reports a case in which he has employed the method

¹ Lancet, March 28, 1903.

² Boston M. and S. Jour., Sept. 25, 1902.

³ YEAR-BOOK, 1902.

⁴ Med. Rec., Aug. 9, 1903.

⁵ Med. News, June 27, 1903.

described by Weir for the purpose of irrigating the colon. The operation is termed **appendicostomy**. The patient was a woman, 53 years of age, who was suffering from extensive ulcerative colitis involving also the rectum. She was in no condition to stand any extensive operative procedure, and the simple operation of bringing the appendix through the abdominal wall and suturing it in this position was carried out. To ascertain that the organ was patulous, it was immediately opened and a bougie was introduced into the cecum. It was then constricted with a suture which remained in place until the first irrigation of the bowel was carried out, 24 hours later. Great improvement followed the irrigations with nitrate of silver solution, and the appendix made an excellent fistulous opening through which it was easy to introduce a tube and through which nothing passed from the intestine. In this operation there is no probability of the appendix becoming acutely inflamed, but if it does so it can be dealt with very easily. Meyer expresses his intention of employing this operation in cases of ileus due to cancer of the large intestine in which it is desirable to relieve the obstruction before attempting a radical operation. The advantages of such a procedure are enumerated as follows: "(1) Saving of time; (2) reducing the possibility of infection, since the distended bowel would be opened only after the closure of the peritoneal cavity; (3) obviating the necessity of an additional surgical intervention to close the opening leading into the intestinal tract, the same as is derived from inversion."

Hale White and Golding-Bird¹ present the subsequent history of 3 cases of colitis in which **right lumbar colostomy** was performed several years ago. The first case was one of membranous colitis of 20 years' duration occurring in a woman 36 years of age. A right lumbar colostomy was done on May 13, 1896, and 1 year later the artificial anus was closed without difficulty. The improvement during this year was very great, the patient suffering no bad symptoms and gaining flesh. In November, 1898, or 18 months after the closure of the artificial anus, the patient was living an ordinary life and was active in her habits and was taking moderate exercise. It was necessary, however, for her to take aperients to open her bowels. Nothing was heard from her from this time until February, 1902, when she had relapsed from her improved condition, a return of symptoms taking place in December, 1898. The second case also was one of membranous colitis. The patient was a barmaid 31 years of age. She was operated upon March 3, 1898. The artificial anus was not closed for 2½ years, during which time the patient remained in perfect health, resuming her work 6 months after the operation and subsequently continuing it without interruption. The patient twice refused an offer to have the artificial anus closed, as she feared a return of the membranous colitis. In November, 1901, when the artificial anus had been closed for more than a year, the patient was in perfect health, and a careful examination was made of all bowel movements, which, however, were found perfectly normal. The third case was that of a man, 35 years of age, who had suffered from chronic colitis for 7 years.

¹ Clin. Soc. Trans., xxxv.

The same operation as in the other cases was performed in December, 1898. Some difficulty was encountered in closing the artificial anus in this case, only partial success accompanying three attempts. In February, 1902, the sinus remaining from the last operation had closed spontaneously and the patient was in perfect health. The cause of the failure in the first case to permanently relieve the condition the authors attribute to the fact that the artificial anus was closed too soon. It must also be borne in mind that the patient had suffered from membranous colitis for 20 years and at the time of operation was a chronic invalid. It is thought that posterior colostomy is much to be preferred to a cecostomy. The artificial anus in the cecostomy is controlled with difficulty as compared to the posterior opening and is much more difficult to close. It is thought that the method of making a small valvular opening in the cecum, as has been suggested by Gibson and employed by Bolton and others, is not to be recommended, particularly for the treatment of membranous colitis, since in the authors' opinion irrigation in these cases does more harm than good. It is also thought that the method practised in the cases reported is much to be preferred to that of anastomosing the ileum to the sigmoid; first, because when such an anastomosis is made the irritating contents of the ileum passing at once into the rectum will probably produce chronic diarrhea; secondly, some of the contents of the small intestine will be sure to regurgitate from the sigmoid flexure into the colon and so keep up the colitis; and, thirdly, the implantation will in many instances not be below the whole of the diseased area.

Littlewood¹ presents an interesting and instructive discussion of **malignant disease of the colon** and reports 14 cases in which he has performed **colectomy** with 10 recoveries. His remarks are based on 26 cases of cancer of the colon which have come under his care during the past 4 years. All of these growths were columnar carcinomas. In referring to the diagnosis, it is stated that probably in all cases, when carefully inquired into, there will be found a history of increasing difficulty in getting the bowels opened. In order to make an early diagnosis of malignant disease, or in order to exclude it, the medical man should endeavor in every case of constipation to find the cause of the trouble before prescribing a remedy. The development of constipation after a life of regularity in this respect, and especially if the constipation comes on in attacks associated with colicky pains and the presence of blood and mucus in the motions, should cause suspicion, and a careful examination of the rectum and anus should be made. The cases of malignant disease of the colon are divided into two classes—those in which a definite tumor is present, and those in which there is a constricting ring of growth which it is often impossible to discover by palpation. The larger growths are more likely to be found in the cecum, the hepatic flexure, and the transverse colon. The most frequent seat of cancer is at the flexures. The larger the growth and the nearer it is to the cecum, the less likelihood there is of obstruction, since the fecal matter is more fluid at this point

¹ Lancet, May 30, 1903.

and since the larger growths are less liable to contract and produce narrowing of the caliber. Where no growth can be felt, and yet there is strong reason for suspecting its existence, an exploratory incision is justifiable. Littlewood did this in one of his cases and it was the earliest case of malignant disease of the colon on which he had ever operated. Regarding the use of enemas, it is stated that the author is acquainted with 2 cases of fatal peritonitis due to a malignant ulcer bursting into the peritoneum during the administration of an enema. Age may be of value in deciding a diagnosis, but it must be remembered that malignant disease may occur in the young. The youngest patient in the present series was 28 years of age. The only treatment of malignant disease of the colon is enterectomy. Littlewood performs this operation by controlling the intestinal contents with Doyen clamps fixed near the point at which division is to be made. A strip of redundant mucous membrane is excised from each divided end of the bowel and a continuous suture of catgut is passed through the muscular and serous coats for one-half the circumference. This is followed by a continuous suture of the mucous membrane alone which passes around the entire circumference. When it is completed, the first suture is again taken up and completed. Two rows of sutures are thus employed, one in the mucous membrane and one in the muscular and serous coats. They are each of either chromic or formalin gut and are interrupted at two or three points by knotting so as to prevent narrowing of the lumen of the bowel by traction. The opening in the mesentery is closed by applying three or four catgut ligatures which include both of the cut edges. This procedure prevents the possibility of perforating a mesenteric vessel which sometimes occurs when a needle and thread are used to suture the edges of the mesentery. After the completion of the anastomosis the omentum is wrapped around it if possible and the abdomen is closed without drainage. When an end-to-end anastomosis cannot be accomplished a lateral anastomosis should be made. In cases of complete obstruction in which the exact position of the growth cannot be ascertained Littlewood prefers to open the abdomen in the middle line sufficiently to admit the hand and arm. The intestine is not allowed to escape while the hand makes a careful search for the point of obstruction. The search should be begun at the top of the rectum and carried around the large intestine to the cecum. After the growth has been found the liver and other organs should be carefully examined for secondary deposits. A preliminary colostomy should be performed and later an enterectomy. This was done in 3 cases of the present series, 2 of which recovered. Another plan which can be practised in the presence of an acute obstruction is the withdrawal of the loop of bowel with the growth, its fixation in the wound, and its subsequent removal. This was done in 2 of the cases here reported; in each case the bowel and growth were removed a fortnight after the first operation without an anesthetic. Both patients are now living, the first having been operated upon in June, 1899, and the second in October, 1901. If the growth is not removable, or if there are secondary growths, a lateral anastomosis can be formed or a permanent artificial anus estab-

lished. Brief reports of the 14 cases operated upon are presented in a table.

Keith¹ makes the **nature and anatomy of enteroptosis** the subject of three Hunterian lectures. He claims: (1) that a knowledge of the respiratory movements of the viscera gives the key to the manner in which they are fixed and placed within the body; and (2) that with any marked deviation in the action of the muscles of respiration there is a disturbance in the visceral movements, resulting in displacement and disorganization of function. Keith says that when the respiratory balance is upset the viscera of the chest as well as the abdomen are displaced downward, resulting in the condition of enteroptosis. In many of these cases the displacement of but one organ is noticed; yet, if careful examination is made, it will be shown that all the organs are displaced, but to a less degree. This paper is a lengthy one and deals largely with the anatomy and function of the various muscles and their development, as well as the location and fixation of the various viscera. It is numerously illustrated, which illustrations do much toward making the author's text clear. **Ptoxis of the liver and stomach** arises from the relaxation of the abdominal muscles, which maintain the visceral shelves on which these organs rest, or from constriction of the cavity by clothing. This point is excellently illustrated by a cut which represents the waist and viscera of a woman, 45 years of age. After death the waist was reduced from 26 to 22 inches, the tissues hardened, and the result represented in the cut obtained. The author devotes considerable attention to the various agents which aid in the fixation of the kidney. Displacements of this organ are brought about by compression of the thorax with clothing, by the partial collapse of the thoracic wall following chest and spinal disease, and by the permanent contraction of the diaphragm which follows a relaxed or parietic condition of the abdominal walls. Keith accounts for the infrequent displacement of the left kidney by the fact that the very freely movable splenic flexure of the colon acts as a safety-valve when the region is constricted. He shows how easily it is displaced to the left and downward by a full stomach. In addition, the left kidney is bound to the spleen, and the spleen is bound to the diaphragm. On the right side the arcuate fibers draw down the heavy liver against the kidney, whereas on the left side it is only the fundus of the stomach that is drawn down. Attention is called to the fact that in infants there is no difference in the position of the kidneys in the two sexes. It is shown that the kidney may be displaced upward as well as downward by lacing, according to whether a woman maintains a high or a low waist. In closing, fixation of the intestinal tract, its movements and displacements, are briefly considered. In discussing the fixation of the intestinal tract the subject is looked at from the point of view of comparative anatomy. The intestinal displacement may be due to the diminution of the costal portion of the body-cavity, the subcostal viscera being thrust down upon it, or to the want of support afforded by the muscular wall of the stomach.

¹ Lancet, March 7 and 14, 1903.

RECTUM AND ANUS.

Mackay,¹ of Melbourne, reports 2 cases of foreign bodies in the rectum of infants. The first patient was a male child 2 years of age who was admitted to the hospital with marked distention of the abdomen and suffering from great pain. For the previous 3 months the child had been cross and ailing. He was not weaned, but nevertheless ate everything given him. The abdominal walls were so tense that when the child was anesthetized nothing could be made out by palpation. An examination of the rectum revealed a glove-button which was acting like a valve and closing the narrow anus. It was removed with a scoop. A



Fig. 33.—Mitchell's operation for hemorrhoids. A pile is clamped in a long narrow-bladed forceps—Kocher's artery forceps answers admirably (*Brit. Med. Jour.*, Feb. 28, 1903).

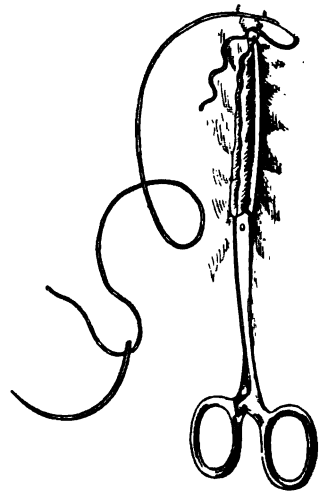


Fig. 34.—Mitchell's operation for hemorrhoids. The redundant mucous membrane and pile are cut away with scissors. A curved needle threaded with catgut hardened in formalin is then inserted immediately above the clamp and the end of the catgut secured by a knot (*Brit. Med. Jour.*, Feb. 28, 1903).

collection of beads, cherry-stones, plum-stones, and pieces of road metal was then removed, and an enema brought away a large quantity of normal fecal matter. The abdomen became flaccid and the patient comfortable. Three days later, however, a large doughy mass was felt in the right hypogastrium. The child was again anesthetized and several pounds of fecal matter were removed by washing through the high rectal tube. This fecal matter contained plum-stones, cherry-stones, chaff, egg-shell, pieces of straw, and quantities of undigested food and fruit skins. The second case was that of a male child 2½ years of age who was admitted to the hospital straining with pain. The child had been born with an imperforate anus and a small opening had been made. An

¹ *Intercol. Med. Jour. of Australasia*, May 20, 1903.

examination with the finger revealed a plum-stone plugging the anal opening. The anus was dilated and two plum-stones were removed. The opening was enlarged by several radiating incisions. The child has had no further trouble.

S. Lewis¹ reports 8 cases of **anal fissure** which he has cured by repeated applications of a saturated solution of potassium permanganate followed by the introduction of suppositories of anosol. The ulcerated area is first anesthetized with a 6 % cocain solution applied on a cotton pledget for 15 minutes. Occasionally the sphincter has been stretched with a bougie, but this is seldom necessary.

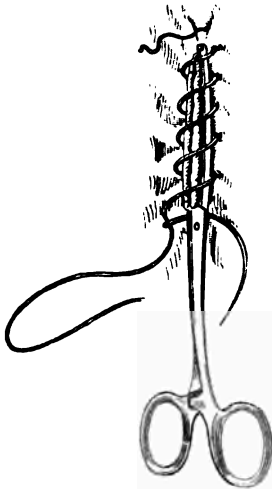


Fig. 35.—Mitchell's operation for hemorrhoids. A continuous suture is rapidly applied round the clamp (Brit. Med. Jour., Feb. 28, 1903).



Fig. 36.—Mitchell's operation for hemorrhoids. The clamp is withdrawn (this can be done without the slightest difficulty) and the suture tightened, leaving a vertical line of continuous sutures within the rectum. The upper end of the ligature, which is left long for the purpose, should be held firmly in the left hand while the lower end is being tightened, so as to prevent puckering. Each pile is treated similarly in turn (Brit. Med. Jour., Feb. 28, 1903).

A. Rose² reports minutely a case of **rectal fistula complicating hemorrhoids** which was cured by passing through it carbonic acid gas. Marked improvement was noticed after one or two treatments, and in a very short period of time the fistula was entirely closed.

A. B. Mitchell,³ of Belfast, recommends the simple operation for **hemorrhoids** which is illustrated in the accompanying cuts (Figs. 33-36). The advantages of the method are its control of hemorrhage and the formation of a linear scar.

John O'Connor⁴ is an ardent advocate of the **Whitehead operation in the treatment of hemorrhoids**. He has employed the method in 150 operations. No death has occurred in this series and in only 5 instances

¹ Med. News, May 20, 1903.

³ Brit. Med. Jour., Feb. 28, 1903.

² N. Y. Med. Jour., Jan. 31, 1903.

⁴ Boston M. and S. Jour., Feb. 26, 1903.

did any appreciable contraction follow. Contraction occurred in his earlier cases where injudicious encroachment on the skin was made. He has applied the operation to all kinds of patients and in not a single case has a relapse occurred. It is maintained that no excessive hemorrhage takes place during the operation if it is properly performed. During the past 12 months O'Connor and his colleague Phelps have operated upon 26 cases and the average time of operation was $12\frac{1}{2}$ minutes; the maximum time was 20 minutes (only one case) and the minimum 5 minutes. This result is opposed to the frequent text-book statements that the operation is objectionable because of the long time required for its performance. The author employs a slight modification of the original operation, and describes his technic as follows: "(1) Artery-forceps are applied to the four cardinal points of the roset, or if the case be nonprotrusive, the forceps are applied at same points about $\frac{1}{4}$ of an inch from skin margin. The assistant by making traction on two adjacent forceps removes the rugose condition, and brings the line of junction of skin and mucous membrane readily into view, while I divide around with scissors about $\frac{1}{4}$ of an inch from skin. (2) The mucous membrane is next separated from underlying structures by passing the left index-finger into rectum, which acts as a most efficient guide, while, with a blunt dissector, and an occasional snip of a scissors, the mucous cuff is raised, and separation carried well above pilous zone. So far there is generally very little hemorrhage, but if any should occur it is immediately ligated with catgut. Care is necessary during this part of the operation not to injure the sphincters by any reckless scissoring. If the mucous membrane is divided deep enough at the commencement, the blunt dissector and fingers do the rest. (3) By the four artery-forceps originally applied, the cuff of mucous membrane is drawn outward, and it is transversely divided above pile area. In doing this it is most necessary to determine the extent of each scissors snip by the amount of hemorrhage, every spurting vessel must be at once caught up in forceps, and by working round in this manner it is surprising how little blood is lost. When the cuff has been removed, each bleeding point is ligated with catgut. I usually retain a few forceps in position after ligation, as they are useful during the next move; namely, approximation of mucous membrane to skin. (4) All hemorrhage having been effectually arrested, the part is well irrigated with warm salt lotion, and the mucous membrane is attached to skin by a continuous catgut suture." The key to success is not to draw this suture too tight. A tight suture causes necrosis of tissues. Under no circumstances should the suture be employed to control hemorrhage. All bleeding should be arrested before the suture is introduced. Careful cleansing of the part after operation is employed. In his recent operations O'Connor has abandoned the wide dilation of the sphincter; the muscle is only stretched sufficiently to permit the hemorrhoids to come fully into view.

Metcalf,¹ of Detroit, advocates a plan of treatment for **hemorrhoids** based upon an experience of more than 700 cases with operation during

¹ Jour. Am. Med. Assoc., Sept. 20 1902.

the last 10 years. The method employed depends upon the fact that the arterial supply of internal hemorrhoids comes from above the vessels entering parallel with the gut, and the tendency of these arteries when cut is to retract within the loose tissue of the tumor. The vein extremities can be cut without danger of hemorrhage. This refers to uncomplicated internal hemorrhoids, which the author believes always arise between the sphincters. In those few cases in which they extend above the internal sphincter the danger of hemorrhage is greater and the ligation of arteries is occasionally necessary. In the operation the bivalve speculum of Pratt is used, and it is so adjusted that the tumor presents between the separated blades. The mucous membrane covering the pile is stripped off on either side until the veins are thoroughly exposed. These are then clipped off with scissors. When the veins have emptied themselves the tumor will have disappeared unless there is a quantity of fibrous tissue, which, when present, should be cut away to the level of the vessels. If a vessel bleeds it is grasped with artery-forceps. The remaining hemorrhoids are treated in the same manner. The largest arteries are found one anterior and one on either side near the center. When all the hemorrhoids have been exposed and evacuated, the sphincters are gently and thoroughly dilated and bleeding points are looked for, and, if found, are ligated with fine catgut passed through the tissue as a stitch. The thorough divulsion of the sphincter is a potent factor in lessening the venous hemorrhage. A plug of iodoform gauze is then introduced and allowed to remain until the patient complains of some pain, usually before consciousness completely returns. The plug is then taken away and its removal clears away any small clots which may have formed. Afterward the parts are dressed with sterile gauze compresses wrung out of water as hot as can be borne. These compresses lessen the tendency to spasm. Morphin is seldom required in female patients. The bowels are not opened until the fifth day, by which time the wounds are covered with epithelium and there is no infection from the passage of fecal matter. When the whole circumference of the rectum is diseased and prolapsed, amputation of the redundant mucous membrane is advisable. The secret of success in this operation is to avoid the removal of any skin. If this is not done, the skin is drawn within the grasp of the sphincter and the patient suffers a great deal of pain. The same after-treatment is carried out. This operation is indicated in about 5 % of the cases operated upon. The results have been most satisfactory.

Lofton¹ describes in detail a case of hemorrhoids which he treated by **repeated injections of hot salt solution** with a most satisfactory result. The patient received the first injection in April, 1900. Eight hemorrhoids were treated in this manner. From 20 to 30 drops of very hot salt solution were injected into each tumor. Little or no pain was experienced from the injection. After the operation the patient walked 3 miles to her home and the next day worked in the field. At the end of a week examination showed the hemorrhoids sloughing. In 4 weeks the wounds were healed. In this same manner 17 cases of hemorrhoids

¹ Med. Rec., March 14, 1903.

have been treated with the same good results. In his later cases, by using a metal syringe, Lofton was able to inject boiling water.

An extensive discussion of the **treatment of prolapse of the rectum** is presented by A. E. Halstead,¹ who reaches the following conclusions:

"(1) All cases of prolapse of the mucous membrane alone can best be treated by resection of the protruding mucous membrane and suture of the cut end to the skin of the anus, as in Whitehead's operation for hemorrhoids. In mild cases clamping and cauterizing linear folds of the prolapse is sufficient to effect a cure. (2) In recent reducible prolapse of all coats of the rectum, removal of the cause if possible, with massage, gymnastics, and appropriate internal medication to improve the patient's general condition, should be first tried. If these fail, amputation or intraabdominal suspension is indicated. (3) In young children operative treatment of prolapse is seldom required. The removal of the cause, which can usually be accomplished, with rest in horizontal position, tonics, and massage, will in the great majority of cases cure the patient. Among the most frequent pathologic conditions which bear a direct causal relation to prolapse in children are intestinal catarrh, rachitis, phimosis, and stone in the bladder. (4) In old irreducible or in recent strangulated cases, the only treatment is amputation by the method of Mikulicz. (5) In old irreducible prolapse, or in recent cases where a fair trial of palliative remedies has been given, we have the choice of two methods—amputation or intraabdominal fixation. At the present time no authoritative statement can be made as to the value of colopexy. It possesses the following advantages: it is not dangerous, it is easily performed, and when it is not successful it does not leave the patient in any worse condition than before. Inguinal colostomy should never be performed except when some special indication exists—*e. g.*, when prolapse is associated with colitis which does not yield to treatment, or when stricture or malignant diseases are present. Simple catarrhal inflammation of the prolapsed rectum does not justify opening the colon. (6) Rectopexy, if employed, should be used only in the lesser degrees of prolapse of the rectum. In invagination of the rectum and colon it is of no value. In any case its disadvantages and dangers outweigh its good points."

Stephen Paget² describes a case of **prolapse of the bowel with loss of control** following perineal excision of the rectum for cancer in a patient 65 years of age. The condition was relieved by the **submucous injection of paraffin**. At the time of operation the patient was wearing a plug to control the bowels, but it only imperfectly accomplished its purpose. Since the excision 7½ years had elapsed. The patient was only comfortable at night when the support was not used. In spite of the support the prolapse would come down. The control of the bowel was very deficient and the patient's life was rendered miserable. The prolapse amounted to about 2 inches of healthy mucous membrane. The patient was anesthetized and paraffin was injected at several points under the mucous membrane. Two hard round nodules were raised, one lateral and one posterior, about ½ inch in diameter and ½ or ¾ of an inch in

¹ Medicine, June, 1903.

² Brit. Med. Jour., Feb. 14, 1903.

height. Before the injection the bowel easily admitted 3 fingers and no sphincteric action could be discovered. After the injection but one finger could be introduced. There was no pain or tenesmus after the operation and only very trivial discomfort for a few hours. About a month has elapsed since the operation and there has been no return of the prolapse and no escape of the bowel-contents. The patient is perfectly comfortable and has no difficulty in keeping himself clean. It is possible that sooner or later another injection may be needed, but there is at present no reason to expect this. "The points to be noted are that the paraffin must be injected immediately under the mucous membrane of the prolapse, not outside the bowel, but into the fold of everted mucous membrane; that numerous punctures must not be made, but only one or two, lest a vein should be wounded; that the prolapse, with the nodules of paraffin in its submucous layer, must be put back at once, and kept back;

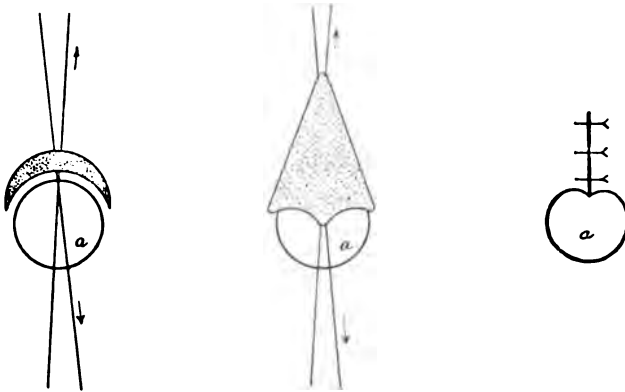


Fig. 37.—Robson's operation for incontinence of feces due to relaxed or paralyzed sphincter ani, a, Anus. The dotted area shows the wound pulled open, the arrows showing the direction of traction. The third illustration shows the anus reduced in size, and the wound closed by sutures (The Practitioner, Feb., 1903).

that the bowels must be kept inactive for several days after the operation; and that the patient must be kept in bed for 10 or more days till the tissues are thoroughly contracted."

A. W. Mayo Robson¹ describes an operation for **incontinence of feces due to relaxed or paralyzed sphincter ani**, and details a case in which he performed the operation with most satisfactory result. The operation consists in making a semilunar incision at the junction of the skin and mucous membrane around the anterior half of the anus. This is deepened to about $\frac{1}{4}$ or $\frac{1}{2}$ an inch; the upper and lower margins are then separated by being drawn apart so as to make the semilunar slit into a lozenge-shaped cavity, as shown in the accompanying illustration (Fig. 37). This cavity is closed by bringing together the sides by means of buried catgut sutures and the skin by silkworm-gut sutures. This leaves a straight wound which is entirely external to the bowel; and it not only

¹ Practitioner, Feb., 1903.

diminishes the size of the anus, but also restores the power of the sphincter muscle.

Emil Ries¹ discusses the **treatment of extensive rectal strictures** and

describes in detail an operation which he performed 5 years ago. There are 3 dangers which result from the treatment of extensive rectal strictures. They have their origin in the septic field of operation, the changed anatomic relation of parts, and from the menace of recurrence. Reference is made to the frequent extensive adhesions about the rectum and also to the not unusual occurrence of abscesses and fistulas in the peri-rectal tissues. These

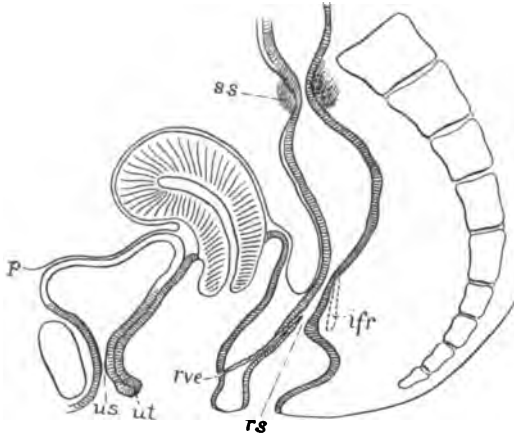


Fig. 38.—Ries's operation for the treatment of extensive rectal strictures. Condition before operation. *p*, Peritoneum; *s.s.*, stricture of sigmoid; *r.s.*, stricture of rectum; *i.f.r.*, internal fistula; *r.v.f.*, rectovaginal fistula; *u.t.*, urethral tear; *u.s.*, urethral stricture (N. Y. Med. Jour., Dec. 13, 1902).

complications render the operative treatment of this condition extremely difficult and dangerous and the likelihood of recurrence much more probable. The really severe cases of rectal stricture never yield to treatment by colostomy or linear proctotomy. Such cases require plastic operations on the continuity of the bowel by which the fecal current is conducted throughout a long healthy bowel. The two methods heretofore usually employed are end-to-end anastomosis after resection of the diseased portion and side-to-side anastomosis without resection. In uncomplicated strictures the first method is often satisfactory, but its performance is frequently extremely difficult and is sometimes impossible. The side-to-side anastomosis of Bacon, which is accomplished

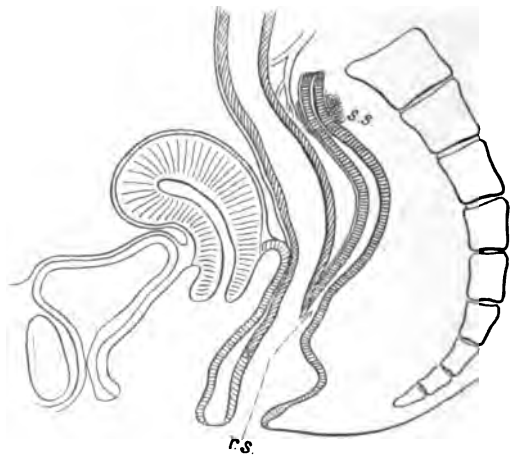


Fig. 39.—Ries's operation for the treatment of extensive rectal strictures. Condition after operation. *r.s.*, Rectal stricture; *s.s.*, stricture of sigmoid (N. Y. Med. Jour., Dec. 13, 1902).

¹ N. Y. Med. Jour., Dec. 13, 1902.

by pulling a loop of intestine above the stricture down to a point below the stricture and joining them with a Murphy button, is only applicable if the stricture is not very extensive and the bowel above it is extremely movable. The case operated upon by Ries was a woman aged 25 who 7 years previously had acquired syphilis. At the time of operation she suffered from a rectovaginal fistula, a stricture of the rectum at the internal site of the fistula, and, as was discovered when an attempt was made to excise this stricture, a second stricture of the sigmoid. The pathologic conditions are well illustrated in the accompanying illustrations (Figs. 38 and 39). The patient at the time of operation was much emaciated and pale, and weighed but 82 pounds. An attempt was made to excise the stricture of the rectum and cure the rectovaginal fistula, but when the surgeon tried to draw down the portion of rectum above the stricture he found it impossible because of a second stricture at the sigmoid, which could be easily felt by a finger introduced into an opening made in the posterior culdesac. The abdomen was then opened, the sigmoid divided above the point of stricture, and the proximal end carried down through the opening in the culdesac and into the rectum nearly to the anus. The healthy gut fitted snugly into the opening in the culdesac and in the incision in the anterior rectal wall, so that no sutures of the peritoneum were used. The extremity of the gut was attached to the rectum below the rectal stricture by 4 silkworm-gut sutures. Before doing this work, however, the distal end of the sigmoid had been inverted and the abdomen closed. The rectovaginal fistula was excised and the posterior vaginal wall sutured. The patient recovered in spite of some infection of the wound and rapidly improved after the operation, being able to return to her home 19 days later. She was seen some 5 years after the operation, when she had gained 58 pounds and weighed 149 pounds. Passages were natural and there was no discharge of mucus and she had no incontinence. Rotter, of Berlin, has published 3 operations similar to this, which he calls sigmoideorectostomy. His first operation was performed about a month after the operation just described by Ries, but before the latter had published anything about his case.

Sir Chas. Ball,¹ of Dublin, delivered the Erasmus Wilson lectures before the Royal College of Surgeons, taking for his subject **adenoma and adenocarcinoma of the rectum**. In his first lecture he deals with simple, multiple, and congenital adenomas. It is difficult to differentiate clearly between benign adenoma and malignant adenocarcinoma. So long as the epithelial proliferation is small and of superficial development it may be looked upon as benign, but if it pierces the basement membrane and infects the submucous layer and muscular coat or involves the tissues external to the bowel-wall we are obliged to look upon it as malignant, as it presents all the clinical characteristics of malignancy. Digital examination in some cases will enable us to differentiate between the benign and malignant forms with confidence, the superficial character or softness and the mobility of the simple adenoma being obvious, while in the case of malignant growth its hardness and fixation indicate its malignancy. In

¹ Brit. Med. Jour., Feb. 21, 28, and Mar. 7, 1903.

most instances, however, a microscopic examination alone will define the true nature of the growth. It is shown that local irritation will frequently cause the development of simple adenomas, as is seen in cases of prolapse of the rectum in young children and as when a like condition takes place after colotomy. The term "polypus" applied to the pedunculated adenoma is strongly objected to. Treatment of the benign adenoma is very simple, and consists in ligation if pedunculated and excision if sessile. Among the congenital sacral growths which are frequently met with there is one variety which shows distinct evidence of having originated in adenomatous tissue. Although occasionally these tumors are directly connected with the rectum, in the majority the relation to the coccyx and sacrum is much more intimate and the tendency to growth is more outward than inward, although Ball refers to one case in which the growth was entirely inside the pelvis. The mechanical effects produced by pressure of unusually large adenomas occasionally give rise to important symptoms, such as intestinal obstruction and retention of urine, and they may also seriously obstruct parturition. These complications, however, rarely arise except in connection with the embryonic adenomas.

The second lecture presents a discussion of adenocarcinoma. There are two distinct types of this disease: one a flat nodule in the mucous and submucous tissues, spreading somewhat rapidly and occurring more commonly in comparatively young patients. The other is more superficial, does not grow so rapidly, contains more fibrous tissue, and by contraction interferes with the caliber of the bowel. This variety occurs in older patients. The symptoms of cancer of the rectum are carefully detailed and marked emphasis is laid upon the urgent necessity for early local examination in all cases of chronic diarrhea. The successful treatment of rectal cancer depends upon early diagnosis. When the growth becomes fixed and the lymphatics are involved, the chances of a successful removal become greatly lessened. The lymphatics at the back of the rectum are the first to become involved, and then those along the great iliac vessels are implicated. Metastatic growths are seen usually in the liver, although they have occasionally been observed in the lung and elsewhere. Wherever found, they reproduce accurately the original type of disease. Associated with adenocarcinoma it is not uncommon to meet with polypoid growths, and it is thought probable that these neoplasms are the result of the direct irritation of the discharge from the cancerous mass. Occasionally cancer of the rectum undergoes colloid degeneration, and it is this variety which is liable to be mistaken for tertiary syphilis. When the rectum is examined the most careful investigation should be made of the abdominal organs. It is important to learn whether or not the growth is movable, as upon its degree of mobility will depend both the prognosis and treatment. The greater the fixation, the greater will be the involvement of the glands and the less the likelihood of complete removal.

In his third lecture Ball discusses the surgical treatment of cancer of the rectum. He advocates the most thorough preparatory cleansing of

the bowel, both above and below the growth. This is accomplished by the administration of purgatives for a number of days before operation and by the use of the tube passed beyond the growth. If it is impossible because of the constriction thoroughly to empty the bowel above the disease, a preliminary colotomy should be done. If thorough cleansing is possible, colostomy is unnecessary. It is recommended that the perineal excision should be confined to those cases in which the growth is limited to the anal region. In operating upon rectal cancer the best results will be obtained in those cases in which the growth can be withdrawn through the anus as if an intussusception had occurred. The sacral route is the one which Ball favors, and he prefers to remove the coccyx and a portion of the sacrum if necessary rather than to form an osteoplastic flap. The best results in these cases will be obtained where after the excision of the growth the proximal portion of the bowel can be invaginated into the distal portion and attached at the anus. This invagination is done after the entire mucous membrane of the lower portion has been removed. It is believed that the abdominal route for removing rectal cancer will become more and more popular, as it permits the removal of the entire growth as well as the involved glands.

C. H. Mayo¹ describes the **evolution** which has taken place in the **treatment of cancer of the rectum**. The following is a summary of the main objections to the operations of the past: (1) Ineffectual removal with local recurrence, so common in the perineal type. (2) The extensive mutilating character of the Kraske method before operative conditions were known. (3) The frequent failure of all methods of union of the proximal and distal portions of the bowel. (4) The frequent formation of stricture, either cicatricial or cancerous, following operation, necessitating inguinal colostomy. (5) The straightening and tension of the sigmoid destroyed it as a fecal container. (6) That sentiment and not chance has proved the main reason for continuing to place an uncontrollable anus in a comparatively inaccessible situation. The combined intraperitoneal and perineal method is advised by C. H. Mayo. This permits the surgeon to suit the procedure to the individual case. He can either radically remove the tumor and glands, or he may simply do a colostomy. When there is total removal, the proximal portion of the bowel, namely, the sigmoid, can be brought out of the abdomen in the left iliac fossa through the gridiron opening of McBurney, giving a fair control of the bowel and not destroying the function of the sigmoid as a fecal container.

W. Watson Cheyne² divides the **treatment of cancer of the rectum** into doing nothing, performing colostomy, and removing the affected portion of the bowel. When nothing surgical is done, the treatment is directed to the relief of symptoms as they arise and the adoption of a variety of palliative expedients. The cases suitable for this kind of treatment are those in which there are fungating masses, chiefly growing from one side of the rectum, as distinguished from those in which the growth encircles and constricts the bowel. Colostomy removes the risk

¹ Jour. Am. Med. Assoc., April 25, 1903.

² Brit. Med. Jour., June 13, 1903.

of obstruction and relieves somewhat the tenesmus and pain and certainly the liability to hemorrhage. But Cheyne does not think it does much to retard the growth of the cancer. Because of the unpleasantness of an artificial anus the performance of colostomy in an early stage when the patient is still comparatively comfortable is not advisable. The question of radical treatment depends on the probabilities of getting rid of the disease by excision and on the risks which will be run in the attempt. Wherever there is a fair probability of ridding the patient of his disease, at any rate for a considerable period of time, and if it can be done without undue risk to life, this operation should be proposed in preference to colostomy, and the decision should be left to the patient. In the majority of cases there is nothing inherent in the form of cancer which occurs in the rectum that contraindicates an attempt at radical operation. Nor is there anything in the situation which renders complete removal particularly difficult in suitable cases. In his own experience the author has had a number of patients remaining alive and well for periods extending up to 9 years since operation. The proportion of suitable cases which come under observation is less than in cancer of the breast and extremities. Cheyne has estimated that only 20 % of the cases which present themselves to the surgeon will be found suitable for a radical operation. Excision is much to be preferred to colostomy in all cases in which there is a fair chance of removing the disease. The operation should only be undertaken in patients who are in a fair state of health, who are likely to stand a severe operation and, it may be, a prolonged convalescence, who are suffering from no other organic disease, and in whom there is no extension of malignancy to other parts of the body. The chief local contraindication is fixation of the bowel at the site of the growth due to infiltration of the whole thickness of its wall. The one exception to this is fixation to the vagina, since the posterior wall of this organ can be removed with the growth. The high situation of the growth is not considered a contraindication, since such growths can be removed by the abdominal or the combined abdominal and perineal routes. Three questions are raised in regard to the method of operation. The first is as to the advisability of performing preliminary colostomy. It is thought that only in exceptional cases is this procedure called for. The chief value of colostomy is in the cases in which end-to-end suture of the divided bowel is carried out, but by varying the method in which the bowel is united from an end-to-end suture to an invagination of the upper into the lower portion the force of this argument is very much diminished. One disadvantage of preliminary colostomy is the time which elapses between its performance and that of the radical operation. As to the question of the best method of reaching the growth, Cheyne refers to the four chief methods which are employed,—the perineal, the sacral, the vaginal, and the abdominal or combined abdominal and perineal. In the majority of cases the sacral method is the most suitable. The perineal operation does not give the necessary amount of room in dealing with the disease, and especially with the affected glands. In discussing the operation of Quénu, the author

prefers to remove the affected portion of bowel above a clamp, invaginate and stitch the lower end of the bowel, and leave it in position, while the other end is brought out of the groin and the ligature about it left *in situ* for 2 or 3 days if possible. There is no great advantage in dissecting out the lower part of the rectum and it adds considerably to the shock and loss of blood. The third question which is dealt with is the avoidance of sepsis and methods of dealing with the divided bowel. The surgeon should avoid any examination of the rectum at the time of operation; he should have ascertained all to be gained from such an examination on a previous occasion. Cheyne always stitches up the anus tightly so as to prevent any escape of material from it during the course of operation. Where it is possible, the diseased portion of the rectum should be brought outside of the wound before the bowel is divided, as the risk of infection is very much reduced when this is done. Cheyne generally employs prophylactic injections of antistreptococcic serum. In cases in which the distal and proximal ends of the rectum can be approximated it is thought much wiser to remove a portion of the mucous membrane of the proximal end and invaginate the distal end. This gives a surer union and one which is less likely to leak and infect the wound. Where anesthesia is not possible, a sacral opening is preferred, but in doing this the open end of the bowel is not stitched to the skin wound. By means of a ligature the divided end of the bowel is kept outside of or at the wound and covered with a piece of dressing, and the wound is then closed with silkworm-gut sutures. The skin around the point of exit is stitched to the muscular coat of the bowel as far above the divided end as possible. If possible, these steps are all taken before cutting off the lower end of the rectum with the tumor. The chief objection to the procedure of leaving the bowel constricted by the ligature is that the escape of gas from the bowel is completely prevented and some patients suffer a good deal from flatulence. Cheyne, however, has never found it necessary to divide the ligature in order to relieve the patient.

Geo. W. Roberts¹ deals with **sigmoidoproctectomy for cancer of the rectum** and reports 3 cases in which this operation was performed. In each case the control of the bowel was very good by means of a hard-rubber cup and bandage. The author's conclusions are as follows: "(1) The accepted methods of operating for cancer of the rectum correspond in lack of thoroughness to the old-fashioned amputation of the breast, supplemented by removal of a few enlarged lymph-nodes from the axillary space. This operation has been supplanted by the superior technic of Halstead, and a more radical method of dealing with cancer of the rectum, which includes removal of the sacral lymphatics, is indicated with equal clearness. (2) In very few cases of rectal cancer indeed is it possible to remove completely even the primary growth from below, for it appears that many inches above the ending of the macroscopic growth cancerous tissue is still found in the mucous membrane. We cannot conceive of the complete removal of the infected glands from the sacral hollow by any of the vaginalperineal, or sacral operations.

¹ Med. Rec., March 21, 1903.

(3) While no one should underestimate the misfortune of an artificial anus, it should be remembered that sphincteric control is frequently lost after severe rectal operations even though the anus is preserved, that in this case the opening is very disadvantageously located for mechanical control, and that an artificial anus constructed as described is practically perfect. (4) We believe that in the vast majority of rectal cancers the above—or some equally radical procedure—should be executed if the patient is to receive the benefit of modern, instead of obsolete, surgical principles. (5) This procedure presupposes a perfect surgical technic and rapid but painstaking work, and especially would we emphasize the great importance of completing the abdominal work before attacking the perineal portion of the operation."

J. Rawson Pennington¹ describes **tube-shields and speculums** which

he has made for the purpose of **treating cancer of the rectum and other cavities by means of the x-rays.** Formerly Pennington employed Caldwell's tube and a metallic shield and tissue cot of his own device. These he has lately discarded, and employs the ordinary Crookes tube covered with the shield shown in the accompanying illustration (Fig. 40). A handle is attached to the shield, and directly opposite the handle is a flange over which the

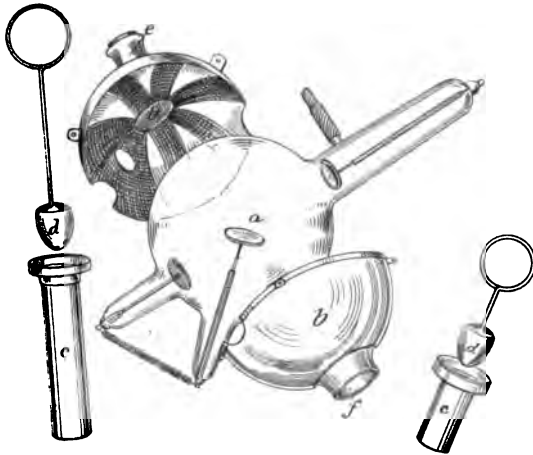


Fig. 40.—Tube-shields and speculums for treatment of cancer of rectum and other cavities by means of x-rays. *a*, Crookes tube; *b*, hemisphere separated; *c*, speculum; *d*, obturators; *e*, tip of the handle, and *f* flange for attaching the speculums (Pennington, in Phila. Med. Jour., Dec. 13, 1902).

rectal speculum fits. The ordinary Crookes tube is so much more powerful than the Caldwell tube that its adaptation to rectal use is a great advantage. The rectum should be carefully cleansed and a small pledget of cotton should be placed in the speculum to prevent the secretions from soiling the tube.

APPENDICITIS.

Eccles,² in discussing the **anatomy and pathology of the vermiform appendix**, refers first to the variations in the mesoappendix, particularly as regards its length. He emphasizes the fact that it is when the aperture of the appendix is closed that trouble is apt to ensue, and not when it is unusually large. As a rule, the aperture is from 2.5 cm. to 3.5 cm. in-

¹ Phila. Med. Jour., Dec. 13, 1902.

² Lancet, March 14 and 21, 1903.

ferior and posterior to the ileocecal opening. Referring to Treves's suggestion that a muscular contraction of a portion of the rectus upon palpation of the abdomen may produce a sensation to the examining hand similar to that of the appendix, Eccles says that in some cases at least he thinks the tissue felt is the contracted anterior longitudinal band of cecum, which contracts under manipulation. Because of the large amount of lymphoid tissue in the submucosa of the appendix this organ has been called the intestinal tonsil. Eccles next points out the characteristics of a normal appendix. He states that it is impossible to say that an appendix is normal until a microscopic examination has been made of its mucous membrane. Regarding the function of the appendix, he believes it to be in part absorptive and in part secretive. As to the etiology of appendicitis, he believes that in every case the disease is caused by bacteria. The various forms of bacteria found in a diseased appendix are referred to. Primary tuberculosis of the appendix is decidedly rare. Actinomycosis of the appendix does occur, though it is of rare occurrence. The various pathologic results of inflammation of the appendix are referred to, including secondary abscess. In speaking of the association of appendicitis with joint lesions, it is stated that when the two conditions accompany one another, the arthritis should be looked upon as wholly secondary to the appendicitis, in the nature somewhat of a sub-acute pyemia. The joint-affection and the appendicitis are not coincidentally due to the same general infection. Appendicitis associated with pregnancy and parturition is not rare. When appendicitis occurs during the first three months of pregnancy, the safest course to pursue is to operate. Abortion at this period is not nearly so serious a complication as it would be later on. When there is strong reason to suspect inflammation of the appendix, it is better to explore than to temporize. When the inflammation has been allowed to progress to perforation or gangrene of the appendix, the mortality is at least 70 %. Eccles claims, therefore, that it is wiser to operate upon even the suspected cases in pregnancy at the earliest possible moment. If miscarriage does take place as the result of operation, there is much less danger than would accompany such a circumstance if an abscess were present. The author does not approve of emptying the uterus before operating upon the appendix, because if pus should have formed it is probable that the alteration in the position of the uterus subsequent to its contraction might open the abscess and flood the peritoneal cavity with pus. And, besides, by operating upon the appendix and not emptying the uterus, the life of the child may be saved. Appendicitis occurring during the puerperal state may be mistaken for sepsis situated in the uterus or its appendages, but a differential diagnosis can be made by a careful examination of the pelvic organs and of the lochia. The prognosis at this period is not so grave as when appendicitis occurs during pregnancy. Eccles discusses appendicitis in relation to life insurance, believing that it deserves greater consideration at the hands of the medical examiner. When there has been more than one attack of appendicitis, he would not pass the applicant unless the appendix has been successfully removed. Innocent

growths of the appendix are extremely rare, though a number of undoubted cases have been reported. The author has collected 14 cases of primary carcinoma and 3 of primary sarcoma of the appendix. Eccles closes with a discussion of hernia of the vermiform appendix, showing that this is much more frequent than was formerly supposed, and that, when the appendix is situated in a hernial sac, it is prone to become inflamed and is frequently strangulated. The diagnosis of an appendix alone in a hernial sac is extremely difficult.

An interesting historical article on **appendicitis** with special reference to the **essay of Mélier**, which was published in 1827, is presented by Thomas H. Manley.¹ A large part of Mélier's memoir is translated and the cases he reports given in detail. It is quite evident from the description of the symptoms and postmortem findings in a number of cases recorded that Mélier understood and was the first to demonstrate the pathologic changes occurring in inflamed appendices. Mélier states that Villiermay was the first to call the attention of physicians to disease of the appendix, but the presentation of the subject to the profession is certainly due to Mélier.

Dieulafoy² urges **early operation in all cases of appendicitis** and reports in detail a case showing the danger of late operation. The patient was a young man, 23 years of age, who had suffered from acute gangrenous appendicitis. Operation was performed on the fourth day. The urine contained albumin, granular casts, leukocytes, and biliary pigment. It was quite evident that he was suffering from septic infection. When the abdomen was opened, the appendix was found gangrenous, and there was a small collection of fetid pus behind the cecum. There was no indication of peritonitis. The patient's condition gradually grew worse, and he died on the fourth day in a comatose condition, and on this day he had frequent attacks of hematemesis. A necropsy was made and many points of hemorrhage in the mucous membrane of the stomach and intestine were discovered. The peritoneum was almost normal. The kidney presented subacute degenerative nephritis, and the centrilobular liver-cells showed granulofatty degeneration. Dieulafoy calls attention to the fact that in this case primary symptoms were not severe, but the dose of toxin produced at the point of infection was sufficiently powerful to cause death. The only way of avoiding serious operative complication due to septic intoxication is by early operation. The operation should be done so early that symptoms of infection and intoxication do not have time to develop. The author states that in all cases with operation before the third day recovery has resulted in those in which operation was performed; during the third day there was also recovery, but in some of them grave complications developed. Operations after the third day show many fatalities due to infection.

A number of cases, 20 in all, showing the results of **blood examination in cases of appendicitis** are presented by Longridge.³ His conclusions correspond to those of Cabot, Da Costa, Joy, Wright and others.

¹ Med. Rec., July 19, 1902.

² Bull. de l'Acad. de Méd. de Paris, July 8, 1902.

³ Lancet, July 12, 1902.

The advantage of the leukocyte count in these cases is that it shows whether or not the morbid process is increasing. More important than the quantitative count is the qualitative count of the leukocytes, since an increase in the polymorphonuclear cells out of proportion to the other elements is indicative of progression. No leukocytosis is found in cases of mild catarrhal appendicitis, in cases of fulminating appendicitis in which no resistance is offered, or in cases of long-standing abscess.

Holman¹ reports an interesting case of **appendicitis** which was followed within a few months by **cholecystitis**. Six months prior to the attack of appendicitis the patient had an attack of typhoid fever and



Fig. 41.—Eastman's appendix forceps with shields attached (*Jour. Am. Med. Assoc.*, Oct. 11, 1902).

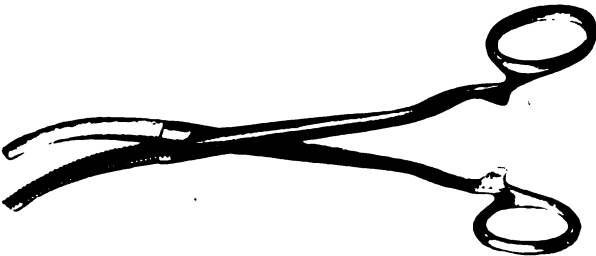


Fig. 42.—Eastman's appendix forceps with shields detached (*Jour. Am. Med. Assoc.*, Oct. 11, 1902).

typhoid bacilli were found in the material evacuated from the gall-bladder. The patient recovered from both operations except that 2 weeks after the second operation when the wound had closed he had an attack of pain resembling hepatic colic. The wound was opened and the ducts were explored with a negative result. He then recovered. After the operation he complained occasionally of left epigastric pain, and some months later had a distinct attack of intense left-sided epigastric pain with tenderness, distention, coated tongue, high temperature, rapid pulse, and respiration. These symptoms subsided under treatment and were thought to be due probably to pancreatitis.

J. R. Eastman² describes an instrument which facilitates the **removal**

¹ *Amer. Med.*, March 21, 1903.

² *Jour. Am. Med. Assoc.*, Oct. 11, 1902.

of the appendix by means of the cautery. It is a simple forceps to the blades of which can be applied shields which protect the cecum and surrounding tissues from the heat of the cautery, and also tend to keep back the small intestine. After the cauterization is complete the shields can be removed and pursestring sutures or Lembert sutures introduced for the inversion of the stump. The advantages of cauterization over ligature are set forth: the immediate sterilization of the stump and the control of hemorrhage. The use of the forceps is shown in the accompanying illustrations (Figs. 41-43).

Howard A. Kelly¹ treats of the advisability of removing the ap-

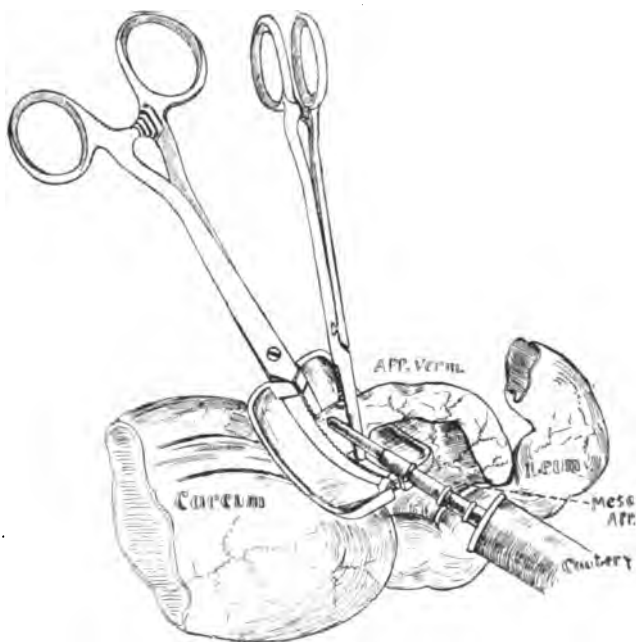


Fig. 43.—Eastman's appendix forceps with detachable shields for the arrest of pus and intestinal contents from appendix verm. and for the protection of intestinal serosa from the heat of the cautery (Jour. Am. Med. Assoc., Oct. 11, 1902).

pendix when the abdomen is opened for other reasons, and has communicated with a number of American surgeons to learn their practice. He reaches the following conclusions: "(1) The appendix should always be examined and its condition noted whenever the abdominal cavity is opened for any reason, provided no additional risk is involved. (2) The opinion of the majority of surgeons in this country is against the removal of a perfectly healthy appendix, 44 to 26 being the proportion shown in his investigation. (3) The opinion of the large majority of surgeons is in favor of removing an appendix which is even slightly adherent to other structures, 60 to 7 being the proportion shown in his investigation. (4) The fact that the appendix is normal in appearance does not prove that

¹ Jour. Am. Med. Assoc., Oct. 25, 1903.

it contains no fecal concretions, for he has found them in a number of instances. Their presence is sufficient reason for the removal of an apparently healthy appendix. (5) After removal of the right ovary the stump should always be covered with peritoneum in order to prevent the risk of adhesion to the appendix. A long and free appendix should invariably be removed."

The subject of **appendicitis, particularly its acute forms**, is dealt with by MacDougall,¹ who presents his personal experience and observation. By reviewing his own and the experience of others in the British hospitals he shows that appendicitis, although not a new disease, is largely increasing both as regards frequency and severity. This statement is fortified by the records of a number of the large hospitals of Great Britain. The tendency to recurrence or relapse is much greater than formerly. In view of the facts just stated, MacDougall's attitude toward the treatment of appendicitis has undergone considerable change during recent years. In the acute grave case of appendicitis he recommends immediate operation. He states that the acuter the initial symptoms, the greater is the gravity of the case. He says that the character of the pulse is of greater value than its rapidity; very high temperature in the beginning, with a rapid small pulse and symptoms notably local, demand quick operative interference. These cases require the most careful nursing and recording of symptoms during their early stages. The facial expression is of great diagnostic and prognostic value. Costal respiration, especially in males, is of considerable importance. In the acute forms of this disease the absence of a palpable tumor in the right iliac fossa should not lead to conservatism when the other symptoms are present. Given a rigor, intense abdominal pain, vomiting, a quick, small pulse, a high or a depressed temperature, a hard contracted abdomen with a point of maximum tenderness within the right iliac sphere, or one marked by the same local conditions with spreading tenderness, short costal respiration, and a drawn face, the safety of the patient demands an immediate operation. The writer sounds a warning about being deceived by a so-called period of repose, a condition which often results from gangrene of the appendix. Even at this period, when the graver symptoms have been modified, the local symptoms are usually sufficiently marked to prevent an error. Leukocytosis may be of some value except in the very acute cases. MacDougall presents the history of a number of cases illustrating his remarks, and discusses briefly the differential diagnosis of appendicitis. He refers to a condition called peritonism, resulting frequently from delayed or suddenly arrested menstruation which produces congestion of the whole pelvis and which has occasionally so closely simulated appendicitis as to cause the surgeon to operate. In this condition the swollen abdomen lacks the tenderness characteristic of inflammation. Commencing basal pleurisy of pneumonia will frequently simulate appendicitis. A careful examination of the chest is sufficient to put one straight. When opium must be given for pain in acute appendicitis, it should be given by suppository or as an

¹ Lancet, Feb. 23, 1903.

injection of laudanum into the rectum. To open the bowels in this condition an enema should be used and not a laxative.

John O'Connor¹ deals with the **treatment of appendicitis**, using as a basis for his remarks a series of 140 cases. He advocates strongly the removal of the appendix at the primary operation and refers to 3 cases in which he has operated for secondary attacks of appendicitis when simple incision and drainage have been done at the first operation. He does not believe that the formation of an abscess results in the obliteration of the appendix. Unless the patient's condition is immediately alarming, the adhesions should be separated and the appendix removed at the primary operation. The key to the treatment of purulent appendicitis is early operation and an incision which permits of thorough inspection of the parts. One of O'Connor's reasons for advising early operation in all cases of acute appendicitis is the fact that it is impossible to tell the exact pathologic condition which is present. The author's attitude is freely fortified by reference to cases. [That an abscess may be followed by obliteration of the appendix we know. Even in an abdominal operation performed long after the drainage of an abscess the appendix was found to have been destroyed.]

Lucas-Championnière² recommends **early surgical intervention in appendicitis** and recounts numerous cases to show the deceptive character of symptoms. Pathologic conditions of extreme gravity may exist without indicative symptoms. The danger of a fatal infection from leaving an inflamed appendix is greater than that of disseminating the infection at the time of early operation. Failure after prompt operation is usually due to the gravity of the infection and not to the extension of the peritonitis. In every case of appendicitis the author maintains that extension of the infection is just as liable to take place as the subsidence of the acute symptoms. He urges in every case the early removal of the cause of the infection.

Broca³ discusses the **treatment of appendicitis**, his views being based upon his personal experience. The author endeavors in this communication to reduce the indications for immediate operation in acute appendicitis. His mortality during a period of 4 years when he operated at once in cases of acute appendicitis was 33 %, whereas when this same class of cases was treated less radically the mortality fell to 13 %. In cases of diffuse septic or suppurative peritonitis it is impossible to separate with certainty those in which operation will fail and those in which it may be successful. The author, however, is in favor of operation except when a patient is moribund. In cases of general infection due to pylephlebitis with or without peritonitis, Broca is opposed to operation because the patient is in no condition to stand the shock of the anesthetic and the operation. He thinks that in these cases the injection of serum offers a sure prospect. Even in such cases when there is an effusion in the right iliac fossa, unless it is known to be pus, an expectant plan of treatment is advocated in order that the appendix may be removed

¹ *Lancet*, Aug. 16, 1902.

² *Rev. de Chir.*, No. 9, 1902.

³ *Jour. m  l. de Brux.*, No. 37, 1902.

during quiescence. It is necessary, however, in such a case that the patient be under the constant care of a skilled practitioner. If this cannot be had, immediate operation should be done. The interval operation should be performed in every case in which there have been two clearly diagnosed attacks of appendicitis, and after a single attack, if it was severe and if suppuration was threatened. The appendix should not be removed until 5 or 6 weeks after the subsidence of the attack.

C. B. Lockwood¹ discusses the **diagnosis and treatment of appendicitis**. He believes that most of the difficulties in the diagnosis and the treatment are due to insufficient knowledge of the morbid anatomy of the condition. Usually the extent and intensity of the inflammation, and whether it is progressing or receding, can be learned from the clinical symptoms. The degree of pain and rigidity indicates the degree of inflammation. Sharp pain occurring at the end of micturition indicates that the pelvic peritoneum is inflamed. It is an ominous sign when vomiting occurs after the gastric contents have been voided. The majority of cases of acute appendicitis run a favorable course. The diagnostic value of the pulse, the temperature, and the respirations is in the order given. The leukocyte count is not a safe guide as to the presence of pus. Rectal examination is of great value when the appendix is located in the pelvis. Paralytic intestinal obstruction is seldom absent when peritonitis has been established for some hours. Each case should be judged upon its individual merits in regard to the question of operation, and when the surgeon is in doubt as to whether or not to operate Lockwood advocates operation, and he thinks it is better to make a determined attempt to remove the appendix rather than to leave it behind. Lockwood does not approve of the use of morphin and purgatives. Enemas skilfully used afford relief and are unattended with any danger.

Moschocowitz² presents a careful and exhaustive study of **primary carcinoma of the appendix** and offers the following conclusions: "(1) No exact figures can be given regarding the frequency of primary carcinoma of the appendix. It is certainly very rare, when compared with the enormous frequency with which the inflammatory diseases of the appendix occur. It is, however, not impossible that in time we shall have to modify our opinion regarding this point, as it appears that more and more cases are being reported, particularly in the last few years. (2) It appears that all "primary" carcinomas of the appendix begin in the mucosa. (3) It seems more than probable that all primary carcinomas of the appendix take their origin in some preceding inflammatory process. (4) Primary carcinoma of the appendix is most frequent at that time of life in which the inflammatory diseases of the appendix are most frequent; and this accounts for the early age of most of the patients reported. (5) Primary carcinoma of the appendix is more frequent in the female than in the male; the cases reported admit the ratio of 3 to 1. (6) If it shall prove true that primary carcinomas of the appendix originate in the inflammatory processes, it forms an additional argument for removal of the appendix, once diseased."

¹ *Lancet*, Dec. 13, 1902.

² *Ann. of Surg.*, June, 1903.

D. S. D. Jessup,¹ in discussing **primary carcinoma of the vermiform appendix**, refers to 13 cases collected from literature on the subject and reports a case of his own. In the author's case the patient was a woman 36 years of age who had had 2 children and 5 abortions. She had suffered with pain in the left inguinal region since the last abortion, and operation was performed for disease of the uterine adnexa. When the abdomen was opened there was found a cyst of one ovary, and this was opened. The appendix was found bound down with adhesions, was removed, and the patient made an uneventful recovery. Upon examination the appendix was found to be 6 cm. in length and bent at a right angle at the junction of the middle and outer thirds. There was also a constriction at this point, and beyond this a dilation 1 cm. in diameter. The proximal two-thirds measured 5 mm. in diameter. In the dilated portion the muscular coat had a thin shell-like appearance and the space within was occupied by a tumor-mass of firm yellow tissue.

Harte and Wilson² discuss **primary carcinoma of the appendix** and report 2 cases, one with operation by Harte and the other by Le Conte.

Deaver and Ross³ present a review of 416 cases of **appendicitis** with operation at the German Hospital of Philadelphia in the year 1901. Of this number there were 279 acute cases and 137 chronic cases. The death-rate in the acute cases was 15.3 %. In the 137 chronic cases there was but one death, a mortality of 0.7 %. This death resulted from acute intestinal obstruction. A mass in the right iliac fossa was demonstrated clinically in 104 cases. In 299 acute cases pus was encountered 174 times; necrosis of the appendix and cecum and small bowel, 145 times; perforation, 84 times. In 11 adults there was a general purulent peritonitis, and all of these died. A general infection is much more common in children than in adults, but is not nearly so fatal. In 154 cases drainage was used. The appendix was removed in all but 7 cases. It had sloughed off at the cecum in 3. Postoperative obstruction of the bowels occurred in 10 cases, in all of which operation was performed and in 4 of which there was recovery from a second operation. The condition was recognized early in every case and operation instituted at once. Fecal fistula appeared in 11 cases. Of these, 4 closed spontaneously; in 1 there was operation with recovery; 6 patients left the hospital with fistula, one of them returning later for operation and was cured. This complication took place in late cases. The authors think it fair to presume that in a good proportion of the cases, if not in the majority, there had been previous attacks of appendicitis. The time elapsing between the onset of symptoms and the operation was as follows: Five hours in 2 cases, 8 in 2 cases, 12 in 5 cases, 14 in 1 case, 16 in 2 cases, 18 in 2 cases, 20 in 1 case, 24 in 18 cases, 30 in 1 case, 36 in 4 cases, 40 in 35 cases, 50 in 1 case, 3 days in 29 cases, 4 in 25 cases, 5 in 18 cases, 6 in 12 cases, 7 in 29 cases, 8 in 9 cases, 9 in 5 cases, 10 in 13 cases, 11 in 5 cases, 12 in 4 cases, 14 in 24 cases, 19 in 1 case, 3 weeks in 11 cases,

¹ Med. Rec., Aug. 23, 1902.

² Med. News, Aug. 2, 1902.

³ Jour. Am. Med. Assoc., Dec. 13, 1902.

7 in 1 case, 8 in 1 case, 10 in 1 case, 6 months in 1 case. Of the fatal cases with operation in the first attack, there are several important facts to be noticed. In one case the death was attributed to the accidental breaking open of the wound and subsequent intestinal obstruction and peritonitis. In another case, with operation within 24 hours, there existed at the time of operation a general purulent peritonitis. The other patient had been ill with the disease from 48 hours to 2 weeks. All but one had abscess and most of them necrosis. The one exception was the patient who died of uremia on the sixteenth day after operation. Another had, in addition to an appendiceal abscess, a carcinoma of the cecum. Death took place on an average of 5.4 days after operation, excepting in 2 cases. Of the deaths, 86 % were due to peritonitis. The 11 cases of general purulent peritonitis which were operated upon and died were beyond surgical relief when admitted to the hospital. The various symptoms presented by these cases are discussed and the line of treatment followed indicated. The authors conclude by stating that in every case of appendicitis operation should be performed in its earliest stage, deferred operation meaning protracted convalescence and invalidism or death.

In dealing with the mortality in appendicitis, its cause and limitation, Ochsner¹ takes as the basis for his paper 337 cases of appendicitis treated in the Augustana Hospital during the year 1902. The point which the author lays the greatest stress upon in the reduction of the mortality in this disease is the starvation treatment in those cases seen late in the disease and in those seen early in which the result of an immediate operation would be doubtful. In other words, the cases selected for this treatment are the worst ones. Of the 337 cases, 192 were acute and 145 chronic. Of the acute class, 81 suffered from perforative or gangrenous appendicitis with more or less extensive peritonitis, but 13 of these had diffuse peritonitis at the time of admission. Of the 81 patients having perforative or gangrenous appendicitis, 37 were operated upon immediately and 44 were treated for a period varying from 4 days to 5 weeks by the starvation method before operation was performed. Of the 111 patients with acute appendicitis without perforation, 107 were operated upon immediately and 4 were treated expectantly. These 4, however, it was thought were suffering from perforative appendicitis at the time of their admission. Also among the 37 cases of perforative or gangrenous appendicitis which were operated upon at once there were several in which Ochsner expected to find the infectious material still confined to the appendix. The author's attitude toward the starvation treatment is explained in the following: "The form of preliminary treatment described above was employed in all of those cases in which my former experience had taught me that the immediate operation would be followed by a high mortality, a class of cases which come to the surgeon on the third, fourth, fifth, sixth, and seventh days after the beginning of the attack with severe distention of the abdomen, tense abdominal muscles, a bad facial expression, marked nervousness, pulse above 100.

¹ Med. News, May 2, 1903.

persistent nausea or vomiting and always a history of having received cathartics and some form of liquid nourishment by mouth." The following summary shows the mortality of this large series of cases; included in it are two patients who were not operated upon and who died: "Entire number of cases with operation, 337; number of deaths, 7; mortality 2 %+. Entire number of acute appendicitis, 192; number of deaths, 6; mortality, 3 %+. Entire number of chronic appendicitis, 145; number of deaths, 1; mortality, 1 %—." A brief history of the fatal cases is presented. The following are the conclusions reached after a discussion of the whole subject of treatment: "(1) The mortality in appendicitis results from the extension of infection from the appendix to the peritoneum or from metastatic infection from the same source. (2) This extension can be prevented by removing the appendix while the infectious material is still confined to this organ. (3) The distribution or extension of the infection is accomplished by the peristaltic action of the small intestines. (4) It is also accomplished by operation after the infectious material has extended beyond the appendix and before it has become circumscribed. (5) Peristalsis of the small intestine can be inhibited by prohibiting the use of every form of nourishment and cathartics by mouth and by employing gastric lavage in order to remove any substances of food or mucus from the stomach. (6) The patient can safely be nourished during the necessary period of time by means of nutrient enemas. (7) In case neither food nor cathartics are given from the beginning of the attack of acute appendicitis and gastric lavage is employed, the mortality is reduced to an extremely low percentage. (8) In patients who have received some form of food and cathartics during the early portion of the attack and are consequently suffering from a beginning diffuse peritonitis when they come under treatment, the mortality will still be less than 4 % if peristalsis is inhibited by the use of gastric lavage and the absolute prohibition of all forms of nourishment and cathartics by mouth. (9) In this manner very dangerous cases of acute appendicitis may be changed into relatively harmless cases of chronic appendicitis. (10) In my personal experience no case of acute appendicitis has been fatal in which absolutely no food of any kind and no cathartics were given by mouth from the beginning of the attack. (11) The mortality following operations for chronic appendicitis is exceedingly low. (12) Were peristalsis inhibited in every case of acute appendicitis by the methods described above—absolute prohibition of food and cathartics by mouth and use of gastric lavage—appendectomy during any portion of the attack could be accomplished with much greater ease to the operator and correspondingly greater safety to the patient.

"I would make the following suggestions for the treatment of appendicitis with a view of reducing the mortality: (1) Patients suffering from chronic recurrent appendicitis should be operated during the interval. (2) Patients suffering from acute appendicitis should be operated as soon as the diagnosis is made, provided they come under treatment while the infectious material is still confined to the appendix, if a competent surgeon is available. (3) Aside from insuring a low mortality this will prevent

a series of complications, mentioned elsewhere in this paper. (4) In all cases of acute appendicitis without regard to the treatment contemplated the administration of food and cathartics by mouth should be absolutely prohibited. (5) In case of nausea or vomiting or gaseous distention of the abdomen, gastric lavage should be employed. (6) In cases coming under treatment after the infection has extended beyond the tissues of the appendix, especially in the presence of beginning diffuse peritonitis, conclusions four and five should always be employed until the patient's condition makes operative interference safe. (7) In case no operation is performed neither nourishment nor cathartics should be given by mouth until the patient has been free from pain and otherwise normal for at least 4 days. (8) During the beginning of this treatment not even water should be given by mouth, the thirst being quenched by rinsing the mouth with cold water and by the use of small enemas. Later small sips of very hot water frequently repeated may be given, and still later small sips of cold water. There is danger in giving water too freely. (9) All practitioners of medicine and surgery, as well as the general public, should be impressed with the importance of prohibiting the use of cathartics and food by mouth in patients suffering from acute appendicitis. (10) It should be constantly borne in mind that even the slightest amount of liquid food of any kind given by mouth may give rise to dangerous peristalsis. (11) The most convenient form of rectal feeding consists in the use of 1 ounce of one of the various concentrated liquid predigested foods in the market, dissolved in 3 ounces of warm normal salt solution introduced slowly through a soft catheter, inserted into the rectum a distance of 2 to 3 inches. (12) This form of treatment cannot supplant the operative treatment of acute appendicitis, but it can and should be used to reduce the mortality by changing the class of cases in which the mortality is greatest into another class in which the mortality is very small after operation."

Parker Syme¹ reports 9 deaths which constitute his **mortality in operations for appendicitis** during the past 13 years. Of these, 5 were of the type of acute gangrenous appendicitis rupturing into the peritoneal cavity without adhesions; 3, of the type of perforating suppurative appendicitis without adhesions or with incomplete adhesions in which there was free pus in the peritoneal cavity with acute general peritonitis or with progressive suppurative peritonitis. In one case there was a circumscribed abscess, and this is the only case in which a fatal termination was not expected and predicted. A study of the histories of these cases shows that in nearly all of them there had been previous attacks of appendicitis from which an apparent recovery had taken place, or that the patients had had symptoms to which they had paid but slight attention, but which would easily have been recognized by a skilled diagnostician. These facts point to the necessity of early operation in every case of appendicitis. The palliative treatment should only be employed in those cases in which an experienced surgeon will feel comparatively sure that the patient is progressing to a prompt recovery,

¹ Jour. Am. Med. Assoc., Dec. 13, 1902.

and in which he may look forward to a safe postponement of the operation to the time of the interval. The author describes his method of operating in the different types of appendicitis. In cases of localized peritonitis with or without abscess, after protecting the general abdominal cavity the diseased area is thoroughly cleansed with hydrogen dioxid and drainage established. In such cases the question of the removal of the appendix arises. Syms removes the organ much more frequently than formerly—in fact, in nearly every case; but he feels that there are cases in which it would be safer to desist from such an attempt rather than to persist. In cases of fulminating appendicitis with general peritoneal involvement every portion of the visceral and parietal peritoneum should be cleansed with thorough sponging and then the entire cavity thoroughly irrigated with hot salt solution. If the patient's strength will permit, the intestines should be systematically washed outside the abdomen. [Like Syms, we remove the appendix in almost every case; but, like him, we feel that in some cases it should not be removed.]

Homer Gage¹ presents an interesting analysis of 300 cases of appendicitis in which he has operated previous to 1901, and in the majority of which he has had recent communications regarding the ultimate results of the operation. Of the 300 cases, 240 operations were done in the course of an acute attack; the mortality of these was 15 %. In 143 cases the appendix was removed at the time of the operation, with a mortality of 13 %; and in 67 it was not removed, with a mortality of 19 %. Recently Gage has removed the appendix much more frequently than formerly, but still believes that there are some cases in which simple incision and drainage are preferable. In 26 of the acute cases there had been no successful effort at localization of the inflammation and the entire abdominal cavity was irrigated. Of these patients, 8, or nearly one-third, recovered. In 60 cases operation was done during the interval between attacks, with one death. This death occurred early in the series of operations and resulted because of an attempt to dispense with drainage when there was a small amount of pus outside of the appendix. Of the 228 cases whose subsequent history Gage has been able to trace, 42 have complaints of one sort or another to make. Many of these, however, are trifling and not in any way connected with the operation. One patient suffered a great deal from pain in the scar after an interval operation. This became so troublesome as to cause the patient to give up her work as a teacher. The abdomen was reopened and the omentum was found adherent to the scar. After it was separated the patient suffered no more pain. In 2 cases fecal fistulas have failed to close spontaneously; one has discharged for 7 years and another for 7 months. Both followed pus cases and in both the appendix had been removed. Of the 228 replies, 19 report the existence of a hernia through the scar. All of these were cases in which drainage had been employed. The majority of the hernias occurred during the first 6 months after operation. In 9 instances attacks simulating appendicitis occurred after operation, and these cases are briefly recorded. In 3 of them the

¹ Boston M. and S. Jour., Oct. 9, 1902.

appendix was not removed at all at the first operation, and in 2 others it was very incompletely removed. Gage is at a loss to account for the reappearance of the symptoms in the 4 cases in which the appendix had been thoroughly removed.

In discussing **foreign bodies in the vermiform appendix** James Bell¹ refers to the great rarity of true foreign bodies in the appendix and states that when foreign bodies do enter the organ they are either accidental occupants, or, if they give rise to symptoms at all, they do so in a different way and do not, as a rule, at least, cause genuine appendicitis. Bell reports an extremely interesting case of a young woman 22 years of age who received a blow in the abdomen from the back of a chair and who developed abdominal symptoms about 50 hours after the injury. During the interval she was able to go about the house and attend to her work. At the end of this time, however, she began to suffer severe pain in the abdomen. Bell operated upon the patient about 38 hours after the onset of abdominal symptoms. At this time she presented all the evidences of severe general peritonitis. It was thought that the patient was suffering probably from a perforated gastric ulcer. When the abdomen was opened, there was free gas and a flow of pus; the whole cavity was filled with pus. There was no perforation of the stomach nor was there any other lesion in the upper portion of the abdomen. An incision was made over the appendix region, where a mass was felt. The appendix stood upright and there was an opening near its base as large as a 5-cent piece, partially blocked by a large faceted gallstone more than $\frac{1}{2}$ inch in diameter. A small stone, also faceted, lay in the appendix beyond the larger one. The appendix was removed and the peritoneal cavity was cleansed and drained. The patient did well, but later developed symptoms of a pulmonary abscess, which could not be located although an exploration was made. Later, pus was expectorated and the patient improved greatly, though at the time of the report she was still feverish and weak. The abdominal condition was all that could be desired. From the history obtained it is thought that the foreign body had been in the appendix for a long time, probably 9 years, and that a slight blow upon the abdomen was the initial factor in producing a large perforation of the appendix.

Malcolm² reports a case of **fecal concretion on a black pin** removed after death from the **vermiform appendix** of a child 6 years of age. The child's illness and death were very sudden and no physician saw the patient. The appendix was gangrenous and ruptured.

The following conclusions are reached after a discussion of the **toilet of the peritoneum in appendicitis** by G. R. Fowler:³ "(1) In cases in which the infection is confined to the appendix the surrounding peritoneum should be carefully guarded against infection from the opening left in the cecum by the excision of the organ. (2) In cases in which suppurative collections are present the cavity of the peritoneum should be carefully guarded by gauze pads, which may be advantageously wet

¹ Phila. Med. Jour., Nov. 15, 1902.

² Lancet, July 5, 1902.

³ Amer. Med., June 20, 1903.

with 1 : 2000 sublimate solution before breaking down limiting adhesions in approaching the appendix. (3) As soon as the pus cavity is opened the septic material should be rapidly sponged away and the neighborhood cleansed with hydrogen dioxid. Following this the appendix should be removed, after which the parts are subjected to a second cleansing process. (4) Outlying infection of the peritoneum may, as a rule, be left to take care of itself after the removal of the appendix and local cleansing. (5) In peritonitis more or less generalized in the pelvic and enteronic areas the method of procedure will depend upon the presence or absence of markedly septic seropurulent material. When the latter is present, it should be carefully sponged away. If only thin and slightly turbid, this will usually suffice. If, however, this is more decidedly purulent, and particularly if flakes of grayish, slate-colored lymph are floating about in it, providing the patient's condition will permit of it, the infected area may be forcibly flushed with saline solution and drained from the direction of the pelvis, the force of gravity being utilized in the after-treatment to encourage the flow of septic fluids from the enteronic to the pelvic area. (6) In diffuse septic peritonitis the conditions are usually such as to prohibit prolonged interference, and the surgeon will, in the majority of cases, be justified in interference only to the extent of removing the appendix and cleansing locally. In selected cases flushing the peritoneal cavity has advantages. The elevated head and trunk position should be employed in the after-treatment whenever possible. Favorable results from eventration can only rarely be claimed legitimately. So-called 'scouring' of the peritoneal surfaces for the removal of plastic lymph is a most unsurgical procedure. (7) Drainage, when instituted, should be by tubes of glass or smooth rubber. Massive gauze packing or multiple and radiating gauze strips placed between the intestinal coils is probably never of real service, and may be productive of harm."

A case of appendicitis is reported by Damianos¹ in which there was **transposition of the cecum** and yet the predominant symptoms were on the right side. The patient was a boy 18 years of age who entered the hospital 2 days after the sudden onset of symptoms. These were quite characteristic of appendicitis in a normally situated appendix. Immediate operation was advised but declined. When the symptoms had subsided, von Mosetig-Moorhof opened the abdomen through the right semilunaris and encountered a mass of adherent small intestine but no trace of the cecum or ascending colon. When the small intestine was pushed to one side, pus escaped from the left side of the abdomen. A second opening was then made on the left side. Here was found a normal descending colon and sigmoid flexure, but immediately to the right of it were the cecum and appendix, the latter surrounded by pus. The appendix was removed and the cavity drained. The patient died 2 days later. At the necropsy the liver and stomach were found in their normal positions. The cecum and small intestine were found to have a common mesentery. Damianos refers to a number of reported cases

¹ Wien. klin. Woch., Aug. 27, 1902.

in which the appendix was situated on the left side, and yet in which, just as in this case, the most prominent symptoms were on the right side.

Jacobson,¹ of Syracuse, reports a unique case of what is called **hemorrhagic appendicitis**. The patient presented all the symptoms of acute appendicitis with marked fever. When the appendix was removed, it was found to present numerous areas of hemorrhage into its substance, but there was no free bleeding into the cavity of the organ, which was distended by a mucoid discharge. The wound was closed without drainage and the temperature fell to nearly normal after the operation. Two days later, however, the patient was seized with intense pain in the left side of the chest and the temperature rose to 102°. Four days after the operation she developed a hacking cough and raised a large quantity of bright red blood. The same night she had a profuse nasal hemorrhage. Next day a number of petechias appeared on the left leg, while on the calves of both legs numerous ecchymoses were found. There was never any hemorrhage from the bowels nor from the kidney, nor was there any evidence of gastric hemorrhage. Epistaxis was repeated and the bronchial hemorrhage was very persistent. About 3 weeks after operation suprarenal extract was administered and there was a prompt cessation of the hemorrhagic manifestations and of the fever. The patient recovered. This case seems to be clearly one of purpura hemorrhagica, of which the first evidence was hemorrhage into the appendix. Reference is made to the reported cases of purpura hemorrhagica in which there have been marked gastrointestinal symptoms, but the author has been unable to find a case which corresponds to the one here reported.

Two cases of **appendicular black vomit** are reported by G. R. Fowler.² Kirmisson was the first to call attention to black vomit in appendicitis. The blood is usually partially digested. Fresh blood or coagulated blood is rarely vomited. Accompanying vomiting of blood there are present usually the symptoms of an intense general intoxication. Vomiting of blood may develop after an operation or it may arise when no operation has been performed. It also occurs in cases in which the peritonitis is but slight. It has been observed also in strangulated hernia. Seven cases of appendicular black vomit have been reported by Dieulafoy; in all of these cases the symptoms occurred only after sufficient time had elapsed to permit a general infection to take place. In 3 of the fatal cases the violence of the hematemesis was such that death took place from the entrance of blood into the lungs. In 2 others it was produced or accelerated by anemia following the vomiting of large quantities of blood. Two of the 7 cases recovered. In all of the appendicular cases perforative appendicitis was present and in 2 there was diffuse peritonitis. In the first case reported by Fowler operation was by R. S. Fowler, and in this case there was general peritonitis with a perforated appendix lying free in the abdominal cavity. There was scarcely any postanesthetic vomiting. Black vomiting developed on the second day.

¹ Med. Rec., Feb. 7, 1903.

² Med. Rec., April 25, 1903.

Examination showed this to contain blood. The condition was accompanied by no increase in the symptoms of peritonitis. Gastric lavage was practised without avail and death took place on the sixth day. There was no autopsy. In the second case operation was by the author. An unusually large gangrenous appendix without adhesions was removed. There was commencing peritonitis in the neighborhood. There was no postanesthetic vomiting; black vomiting commenced 11 hours after operation and continued until death took place, 42 hours after operation and 66 hours following the commencement of the attack. The stomach showed from 200 to 300 small ulcers about the size of a millet-seed. Sections of the stomach-wall showed frequent emboli. Staphylococci were also found in the ulcers. There can be no question that these processes were septic in origin. The view that the microorganisms were transported to and produced thrombi and subsequent embolism in the vessels is sustained, first, by the fact that in one of the sections there was a focus of necrotic tissue in which the microorganisms appeared, the vessels of the submucosa near this area containing recent thrombi; and, second, in another section an embolus appeared involving a vessel in the mucosa near its bifurcation, the vessel and its two branches containing recent blood-clot.

In referring to the various causes of hematemesis Nitzsche¹ reports a case of **hematemesis in appendicitis**. The patient was a man 62 years of age who suffered from a typical attack of appendicitis. Coffee-ground vomit containing blood developed on the second day and the patient died on the fourth day. At the postmortem examination a gangrenous appendix was found in a partially walled off abscess and there were evidences of general peritonitis. There was no thrombosis of veins. The stomach and jejunum held a quantity of dark material containing blood. The mucous membrane of the stomach showed innumerable small points of ulceration partially covered with clotted blood. The ulcerations involved the mucosa and submucosa. In one of the veins of the submucosa a partially formed thrombus was found. As the autopsy was performed 3 hours after death it is impossible that the ulceration could have resulted from postmortem digestion. Nitzsche believes that the ulceration of the mucous membrane in these cases is of toxic origin. The toxins reach the stomach either through the general circulation or in a retrograde manner through the veins; they are taken up by the gastric glands, and these in excreting them become ulcerated.

A. K. Gerster² presents a valuable contribution on **septic thrombosis of the roots of the portal vein in appendicitis**. The most common cause of septic pyelephlebitis is appendicitis. The condition is considered rare by most authorities. Out of 1189 cases of appendicitis with operation at the Mt. Sinai Hospital in the past 10 years septic involvement of the veins was encountered but 9 times. Septic thrombosis of the portal vein and its feeders may be divided into continued thrombosis in which the condition extends by continuity and in which the circumference of the lower course of the portal vein is rarely involved, the blood passing

¹ Deut. Zeit. f. Chir., Bd. lxiv, 1902.

² Med. Rec., June 27, 1903.

along between the attached clot and the vessel-wall; and detachment of the thrombus with embolism and septic invasion of the systemic system. The detachment of a septic embolus is determined by a number of factors: (a) lack of firm adhesion of the thrombus to the walls of the vessel; (b) loss of consistency of the thrombosis due to septic deliquescence; (c) mechanical forces acting from within or without the body, and among these the author mentions manipulation during operation. It is believed that in many cases of appendicitis, particularly interval operations, which are shortly followed by death and are supposed to be caused by surgical shock, the death results from septic thrombosis and the sudden introduction of a sufficient quantity of ichor into the circulation to produce fatal toxemia. In discussing the symptoms and diagnosis Gerster states that chills accompanied by a rapid rise of temperature during the course of appendicitis, it matters not how mild the local symptoms, may and usually do signify the entrance of septic material into the portal and general circulation, and should be considered a sign of the gravest import. When the condition becomes well established, the patient evidently suffering from marked septicemia, the removal of the diseased appendix and evacuation of pus may either accomplish no good whatever or only result in a temporary subsidence of the symptoms. The morbid process which has become established is beyond the line where measures undertaken against the primary focus would exert a curative influence. "Setting aside, therefore, both the unproved hypothesis of surgical shock and of peritoneal sepsis, the results of our observations at the bedside, the operating room, and especially at the post-mortem table irresistibly force upon our attention, as causative factors of paramount importance, septic phlebitis and thrombosis of the roots of the portal vein and embolic processes dependent upon their disintegration." Special attention is called to the frequency with which this dreaded complication results from operations done after the subsidence of an acute attack of appendicitis, and it is suggested that in these cases a most thorough postmortem examination should be made in order that if possible the undeserved blame should be removed from the operator who has had the misfortune to encounter a patient with a septic thrombosis which is ready to be detached and carried into the circulation on the slightest provocation. "The gist of the matter as to the diagnosis lies in these three propositions: (1) The presence of precedence of an infectious process involving the abdominal contents. (2) The presence of pyemia. (3) The implication of the liver." In order to aid diagnosis Gerster makes the following suggestions: "(1) Demonstrate that the existing pyemia or septicemia is not caused by any lesion within the pale of the systemic circulation, and especially not by malignant endocarditis, a task which is very hard, when not even a murmur is demonstrable to indicate the presence of this treacherous malady. *Note:* A small but important lesion pertaining to the area of the general circulation may be easily overlooked. (2) Do not forget that the violent oscillations in the temperature (from 105° to 96° F.), which are so characteristic of the initial stages, become less and less typical as the disorder progresses. In

protracted cases the fever is of a constant and remittent type, the chills disappear (Chvostek and Gerster), and the oscillations are merely accentuated by profuse sweats. (3) Again and again search for the primary septic focus in the belly. (4) Remember that the evidences of hepatic trouble are often very equivocal. Though the liver is mostly somewhat enlarged, local pressure, pain, and jaundice are often absent. The enlarged spleen is not distinctive, nor do the stools offer anything characteristic. (5) A persistent local pressure along the right rectus abdominis, extending upward toward the epigastrium and accompanied by fever, observed after an appendicitis operation, and with the abdominal wound healing or healed, justifies a strong suspicion of continued pylephlebitis if there are no signs of sacculated peritonitic abscesses." The prognosis is very bad, but not altogether hopeless. The treatment must be largely symptomatic. The occurrence of a chill in appendicitis is of the gravest import, and should be considered to constitute a more urgent indication for operation than even the signs of local peritonitis. The drainage of the infected veins is also recommended. In this connection it is interesting to refer to 2 cases here reported in which upon removing the appendix the author found its veins and those of the cecum involved in a septic thrombosis, and after thoroughly incising and evacuating them both the patients recovered. This contribution is concluded by a report of 14 illustrative cases.

Sonnenburg¹ finds from examination of his records of 1000 operations for **appendicitis** that lung complications developed in 5 % of the cases. In the Moabit Hospital of Berlin 740 cases with operation were recorded. Embolism and infarcts were discovered in 3 patients, 2 of whom recovered; in 5 cases of pneumonia 3 of the patients recovered; in 7 cases of pleurisy and 1 of bronchitis all the patients recovered. In his private sanatorium 13 cases were reported; out of 260 operations, 3 cases of infarct and 9 out of 10 cases of embolism recovered. Of these complications, 12 occurred in operations undertaken during the attack of appendicitis, and only one in an operation during the interval. In 20 cases of thrombosis the right leg was affected 9 times, the left leg 6 times, both legs in 2 patients, the portal vein in 2 patients, and the vena cava in 1 patient. As to the reason of thrombosis and embolism in appendicitis, Sonnenburg believes that in the great majority of cases the cause is infection. The operation, by disturbing the inflamed veins, loosens a thrombus which is thrown into the circulation as an embolus. This may occur either at the time of the operation or, quite frequently, several days later. [Gibbon lost a patient at the Pennsylvania Hospital a number of weeks after an operation for acute appendicitis from a pulmonary embolus. The patient was a very anemic woman who for years had suffered from a large uterine fibroid which completely filled the pelvis. She developed a thrombosis of the left leg, but this promptly subsided and the patient at the time of her sudden death was able to be up in a chair every day. The cause of death was determined by postmortem examination.]

¹ Arch. f. klin. Chir., 1902, Bd. lxxviii; Amer. Med., Dec. 13, 1902.

Under the head of **some unusual cases of appendicitis**, Robert F. Weir¹ presents brief reports of a number of interesting cases. The first case is one of **internal strangulation of the small intestine due to an elongated and adherent appendix**. The tip of the appendix was attached to the side of the lumbar vertebrae and under it was caught a large loop of small intestine. The abdomen was opened, the appendix removed, and the patient recovered. The next case before the operation was supposed to be one of small strangulated hernia, but when an incision was made the condition was found to be one of **hydrocele of a hernial sac**. When the abdomen was opened, an acutely inflamed appendix was found near the femoral ring. Before the operation the abdomen was generally soft and free from rigidity, but there was a little tenderness above Poupart's ligament; no more, however, than is often felt in a strangulated hernia. The appendix when opened showed its walls and its mesentery to be thickened and infiltrated with pus. In both this case and the one preceding it there was absence of rigidity of the abdominal wall, the presence of which is with justice looked upon as evidence of peritoneal inflammation. The third case reported is one of **gangrenous appendicitis occurring in a hernial sac**. The diagnosis in this case was of strangulated or incarcerated hernia. Brewer operated and removed a gangrenous appendix. The patient made an uncomplicated recovery. Another case operated upon by Brewer is also referred to in which a diagnosis of **small ovarian cyst** was made. This patient, a woman aged 38, had been operated upon 5 years previous for appendicitis, and it was supposed that the appendix had been removed. Through the stretched cicatrix could be felt an elongated swelling 5 or 6 inches long, just outside the iliac artery and running forward toward the anterior brim of the pelvis. This mass was movable but also tender on pressure. When the abdomen was opened, the tumor was found to be a cystic enlargement of the appendix measuring $4\frac{1}{2}$ inches in length and over $1\frac{1}{2}$ inches in diameter. An interesting case of **tumor of the cecal wall following the removal of the appendix** is reported. This patient was also operated upon by Brewer. The patient had had a previous operation in June, 1902, between attacks of appendicitis and the appendix removed and the stump inverted, but was admitted to the hospital in November, 1902, with symptoms of acute appendicitis. It was thought that probably the appendix had not been removed at the first operation, but this, it was learned, was a mistake. There was a small hard sensitive mass to be felt in the region of the cecum under the cicatrix of the previous operation. When the abdomen was opened, no appendix was found, but at its site there was a small hard tumor $\frac{3}{4}$ inch in diameter projecting externally and also into the lumen of the cecum. It was excised and the abdomen closed. The mass was examined microscopically and pronounced to be a chronic inflammatory condition of the wall of the appendicular stump. In order to avoid a similar occurrence it is Weir's custom always to cauterize the mucous membrane of the appendicular stump before inverting it.

¹ Med. Rec., May 23, 1903.

Another case is reported in which a **very short appendix**, $\frac{1}{2}$ inch long, **was productive of several sharp attacks of appendicitis**. The patient was operated upon in a quiescent interval and made a prompt and permanent recovery.

An interesting case of **appendicitis with general peritonitis** is referred to in which operation was by Brewer. The appendix was gangrenous and ruptured and there was free purulent fluid throughout the abdominal cavity. Thorough irrigation was done and a number of gauze drains introduced. The leukocyte count in this case was 34,000. On the second day after the operation there was frequent vomiting and the temperature had reached 106.6° and the pulse 160. The urine was scanty. The case looked hopeless, but the house officer was given permission to try infusions of salt solution. This was repeated a number of times and the stomach was washed out. The temperature gradually subsided and the patient recovered. Weir states that in the Roosevelt Hospital the suggestion of Barker has been followed of adding to the salt solution 5 % of sterilized glucose, and lately the suggestion of Crile of adding 10 to 15 minims of 1 : 1000 solution of adrenalin chlorid.

The last case recorded is one of **cancer of the appendix** occurring in a young man 23 years of age. The patient gave a history of 13 attacks of appendiceal pain within 2 years. The appendix was found to be strongly kinked and knobbed a little more than usual at the end; it was removed and microscopic examination proved that the tip of the appendix contained a small mass of adenocarcinoma. The patient was observed for more than 3 years, during which time there was no recurrence. With the exception of the last 2 cases all of the patients referred to were treated during the past 12 months.

Christian and Lehr¹ present a contribution on **subphrenic abscess as a complication of appendicitis**. Out of 4028 autopsies collected from the Boston City, Johns Hopkins, and Rhode Island Hospitals there were 86 deaths due directly or indirectly to acute appendicitis, and in these 86 cases 7, or 8.13 %, showed involvement of the subphrenic region by a purulent process, although in the strict sense of the word every case was not subphrenic abscess. A report of each of these 7 cases is presented. Five were males and 2 females. The ages varied between 11 and 50 years. In 4, *Streptococcus pyogenes* was present in several organs; in 1, *Bacillus coli communis*; in the remaining 2 no cultures were taken. In 5 cases the appendix had been removed, leaving only a short stump; in one the cecum and appendix with obliterated lumen were bound down by fibrous adhesions, and behind the cecum was an abscess; in one the appendix was bound down by adhesions, its distal half gangrenous and riddled with perforations. Subphrenic abscess as a sequel to appendicitis may occur in one of the following ways: "(1) As a localized abscess, a part of a general purulent peritonitis; (2) by extension of the diseased process from the appendix to the subphrenic region by an intraperitoneal route; (3) by extension of the diseased process by an extraperitoneal route, either by way of the lymphatics or by infiltration through the

¹ Med. News, Jan. 24, 1903.

retroperitoneal tissues; (4) by way of the blood-current as part of a general embolic septic process, or as a sequence of liver-abscesses which are of embolic origin by way of the portal vein." The greatest number of such abscesses originate by extension, the route depending upon the situation of the appendix and the periappendicular process. It is claimed that when the abscess is retrocecal there is greater liability to the formation of subphrenic abscess. Having reached the subphrenic region extraperitoneally, the abscess may remain so or may become intraperitoneal. Among the cases collected by Elsberg 27 % were extraperitoneal, 48 % intraperitoneal, and 25 % of doubtful anatomic location. In 4 of the 7 cases here reported there was also involvement of the pleural cavity, though in none of these cases was there perforation of the diaphragm. The pleura may become involved in such cases in one of two ways: (1) By extension from a pneumonic focus or infarct in the lung; and (2) by extension from the abdominal cavity, either by way of the lymphatics or by erosion of the diaphragm.

Darling¹ reports an interesting case of **subphrenic abscess on the left side following the removal of the appendix**. The patient was a young woman 21 years of age. When first seen she was apparently recovering from an acute attack of appendicitis. The condition remained satisfactory for 7 days, when there was a severe recurrence of pain with tenderness and tumor in the right iliac fossa. The appendix was found embedded in a mass of omentum, small intestine, and cecum. It was separated and removed with some difficulty. There was no pus, although the appendix was gangrenous and perforated. The patient did well until 10 days after the operation, when she began to complain of pain in the lower part of the abdomen and of difficulty in micturition. These symptoms continued until it was evident that there was an accumulation of pus in the pelvis. The patient was again etherized and a large pocket of offensive pus drained. She left the hospital apparently well, but soon afterward began to complain of pain in the left side high up under the ribs. Her discomfort gradually increased and general tenderness developed over the region of the spleen, occasionally extending downward as far as the crest of the ilium. There was no cough, but deep inspiration was painful. The temperature was 102° and the pulse 110. Later, symptoms developed which made it clear that there was an abscess, but it was impossible to tell whether it was above or below the diaphragm. A lumbar incision along the outer border of the quadratus lumborum was made and a large abscess-cavity evacuated. The patient ultimately recovered. The case is particularly interesting because of the unusual situation of the abscess. Dr. M. H. Richardson, who saw the patient during convalescence, stated that he was inclined to regard the sequence as a coincidence, the two suppurations being of independent origin. Although this may be true, there was no other ascertainable cause for the subphrenic abscess.

W. Blair Bell² reports an interesting case of **appendicular abscess which perforated the ileum** and in this way nearly completely evacuated

¹ Boston M. and S. Jour., July 17, 1902.

² Liverpool Med.-Chir. Jour., Oct., 1902.

itself. At the operation the abscess-cavity was found empty. The perforation of the ileum was closed and the appendix removed. The patient made an uninterrupted recovery.

Thos. S. Cullen¹ reports a case in which he **evacuated a retrocecal abscess which developed 3 years after an operation for an appendiceal abscess** in which the appendix was removed. The patient recovered.

Box and Wallace² report a case of **appendicitis** in which the **symptoms closely resembled those of typhoid fever** and in which there was evidence of a perinephritic accumulation of pus, which, however, could not be discovered through a lumbar incision, and which ultimately ruptured into the colon at the hepatic flexure. The rupture produced profuse intestinal hemorrhage. The pus passed by the bowel was only small in amount and was hardly detected as such; the occurrence of the hemorrhage only tended to complicate the diagnosis, which was not made until the autopsy.

F. D. Donaghue³ discusses briefly **appendicitis complicating pregnancy**, and reports a case in which a gangrenous appendix was removed when the patient was 3½ months pregnant. She did not miscarry but was delivered at term. The literature of a similar case is referred to. [Gibbon operated upon a patient at the Pennsylvania Hospital who was 4 months pregnant and who was suffering from an enormous appendicular abscess. The appendix was removed and the abscess-cavity drained. The patient aborted on the third day, but ultimately recovered.]

Edward Ricketts⁴ discusses **puerperal appendicitis** and reports several cases and reaches the following conclusions: "(1) Puerperal appendicitis is as distinct as salpingitis, with or without pus. (2) It can be diagnosed and differentiated from a puerperal septicemia due to other causes. (3) Many cases of peritonitis arise from the infected appendix, and not from the results of pregnancy and child-birth. (4) The reason that puerperal appendicitis has been overlooked explains why it is claimed that appendicitis is more frequent among males than females. (5) With puerperal appendicitis recognized, the disease will be found as often among women as among men."

HERNIA.

Coley⁵ presents an interesting report on the **results of 1000 operations for the radical cure of inguinal and femoral hernia** performed between 1891 and 1902. To date, the author has performed 1075 operations for hernia. The later ones were performed too recently to furnish data from which to draw conclusions. The exact number of cases here classified is 1003; inguinal, 937 cases—male 756, female 181; femoral, 66 cases. Of the patients 317 were over 20 years of age. Coley states

¹ N. Y. Med. Jour., Dec. 27, 1902.

² Lancet, June 6, 1903.

³ Boston M. and S. Jour., Sept. 4, 1902.

⁴ Virginia Med. Semi-Monthly, Nov. 21, 1902.

⁵ Ann. of Surg., June, 1903.

that operation on children is really more difficult than in adults, and does not agree with the many authorities who state that any operation will cure hernia in children. In proof of this statement he says that prior to 1890, in 20 operations performed upon children by the Czerny and Socin methods, there were 50 % of relapses within a year after the operations. Coley compares his cases to those occurring in the Albert-Hochenegg clinic. From this clinic comes a report of 804 operations upon 473 patients. The inclination in this clinic is to operate upon both sides in all cases. Coley's 1003 operations were done upon 911 patients.

For **femoral hernia** he employed the Bassini operation in 16 cases, and the purse-string suture in 50 cases. In the last group there has not been a single relapse. The cases in which the purse-string suture was used were not selected, and Coley uses this method even in large hernias. He performed 181 operations on the female for inguinal hernia with no mortality and no relapse. In the female Coley does not transplant the round ligament, but simply closes the canal over it. In the 67 operations for femoral hernia there was no mortality, and primary union was obtained in every case but one, and this one furnished the only relapse which has been observed. All but 9 of these cases have been traced; 46 were well from 1 to 10 years, and 34 from 2 to 10 years after operation. He performed 14 operations upon 9 patients for direct inguinal hernia. In most of these cases Coley transplanted the cord by the Bassini method. Of 937 cases of inguinal hernia, the cord was transplanted according to Bassini's method with kangaroo tendon for the buried sutures in 917 cases, with 10 relapses, or a fraction over 1 %. "In the entire series of cases, 1003 in number, the **end results** were as follows: 647 were traced and found well from 6 months to 11 years; 460 were well from 2 to 11 years." Attention is called to the fact that in the Vienna Clinic the **double operation**, unless hernia definitely existed upon both sides, **has been abandoned** since 1899. The author confirms by later statistics his former conclusions that patients well one year after operation may reasonably be expected to remain well, and that after 2 years they may be considered permanently cured. A detailed statement of the relapsed cases in this series is presented. The percentage of relapses after the Bassini operation is slightly more than 1. There were 6 relapses in 20 cases of inguinal hernia in which the cord was not transplanted.

Regarding the **technic of the operation**, the author states that he always places a single suture in the internal oblique muscle above the point at which the cord passes through. This is not a part of the Bassini operation, but he believes it to be a decided aid in preventing relapses. The wound is dressed with 10 % iodoform gauze and a spica bandage. In children under 14 years of age he uses a plaster spica. The patient is kept in bed 2 weeks and allowed to leave the hospital in from 2 to 3 weeks, but wears a spica bandage until 4 weeks have elapsed, after which no support is worn. Kangaroo tendon was the suture material in practically all of these cases, and the author is a strong advocate of it. In proof of the statement that a large proportion of the cases of suppurative hernia formerly attributed to catgut or imperfectly sterilized or buried sutures

are really due to other causes, chiefly to infection by the hands of the operators or assistants, it is only necessary to compare the results of wound-healing before and after the use of rubber gloves. In addition to cleanliness, rapidity in operating and clean dissection, especially in separating the sac from the cord without bruising the tissues or allowing them to become infiltrated with blood, are most important. In the 1003 operations here reported suppuration occurred in 30 cases. In 21 of these it was limited to stitch-hole abscess. Since the use of rubber gloves there have been only 5 cases of suppuration in 4 years, and in about 400 cases.

Regarding the **indications for operation**, Coley states that it is seldom advisable under the age of 4 years except in cases of strangulation. After the age of 4 years in all cases in which a truss has been tried and failed, or in which the presence of a reducible hydrocele prevents a truss from holding a rupture, operation is advised. In adults the operation is always advisable under the age of 50, unless there are strong contraindications present. Between 50 and 70 years operation is advisable in patients in good health if the rupture is with difficulty held by a truss. The contraindications are: (1) serious organic trouble of the heart, lungs, or kidneys; (2) very large adherent irreducible hernia in stout individuals, especially when the sac contains both intestine and omentum. The risk of operation under the above circumstances is large and the chances of permanent cure small. When the omentum alone is present in very large adherent irreducible hernia in stout people, the danger is less, but nevertheless is worthy of consideration. Reference is made to several cases in which the omental stumps in these cases has given late suppuration.

The **mortality** in Coley's series of 1003 cases is 2 deaths—less than $\frac{1}{5}$ of 1 %. The first death was due to ether pneumonia in a child, and the second was in an adult with a large irreducible hernia, and resulted from intestinal obstruction in spite of a second operation. Since this death occurred, Coley has performed over 500 operations without a death. Previous to 1890 the mortality was certainly not far from 6 %. In the Vienna Clinic there were only 3 deaths and 804 cases. At the Johns Hopkins Hospital there was but 1 death in 459, and at Carle's Clinic in Rome there were but 2 deaths in 1400 operations upon 1285 patients, and one of these was from pneumonia.

Regarding **special varieties of hernia** Coley has considerable to say. He has operated upon 38 patients associated with undescended testis, and in only one of these did he find it necessary or did he deem it wise to remove the testis. Regarding the proper method of treating cases of hernia with undescended testes there are considerable differences of opinion. Coley, however, states that "believing in the physiologic value of even an atrophied and probably functionless testis, I have made it a practice always to preserve the organ, and have never removed it except on two occasions." He does not advise operation in the majority of hernias with undescended testis in children under the age of 10 years, for the reason that in many cases the testes will later descend into the scrotum spontaneously. When operation is done, he does not advise the anchoring of the organ in the scrotum, but closes the canal by the

Bassini method, drawing the testes outside the external ring. In most cases it will be found that the organ will later spontaneously come down in the scrotum. An interesting variety of hernia, which is called the inguinoperineal type, is described by Coley. In 8 cases he has found the testis in the perineum, and in 6 of these cases the condition was associated with hernia, and in 5 of these operation was done. In every case the sac was a congenital one, and in 4 instances a portion of it was retained to cover the testis, and a pouch was made for the organ in the scrotum. Superficial inguinal hernia is really a variety of interstitial hernia, in which the testicle is arrested just outside of the external ring and the hernial pouch develops between the aponeurosis and the external oblique muscle and the skin. Coley has met with 5 cases, 2 in adults and 3 in children. Hernia of the cecum was found alone in 10 cases; hernia of the sigmoid in 3 cases, and in 8 cases a sliding hernia of the cecum was encountered. Hernia of the bladder was operated upon in one case. Coley has operated upon 3 cases where there was tuberculosis of the hernial sac, 2 in children and 1 in adults. Sixteen cases of strangulated and femoral hernia have been operated upon, with 2 deaths. One death occurred in the case of a femoral hernia which had been strangulated for 3 days and in which a resection of 7 inches of the intestine was made. The other death occurred in an infant 6 weeks old with a strangulated cecal and appendicular hernia. This child was moribund at the time of operation. In the other 15 cases a radical operation was performed and there has not been a single relapse. Primary healing occurred in every case.

A general discussion of the **radical cure of hernia**, with a report and analysis of 116 cases in which he has operated, is presented by Frank Martin.¹ The author recommends the radical cure even in patients of advanced years, and does not consider age a contraindication. These can be operated by either local anesthesia or by subarachnoid anesthesia. The author has used the latter method in 4 cases, in one of which the patient was 68 years of age, a confirmed alcoholic with marked cardiovascular changes, chronic bronchitis, and nephritis. The hernia was a large irreducible one of 20 years' duration. No ill effects followed the operation, and 18 months after it the patient was free from any evidence of relapse. Cocain has also been used in a number of elderly patients. A table of the cases operated upon is presented and several of the more interesting cases discussed.

The **implantation of silver filigree for the closure of large hernial apertures** is advocated by Willy Meyer.² The use of this material is only recommended in those cases which cannot be satisfactorily treated by one of the recognized methods because of the large hernial opening. The net is made in various sizes and shapes to fit the different hernias. It is round, oval, or quadrangular, with blunt corners for umbilical and ventral hernias, and is sutured upon the aponeurosis of the abdominal muscles bordering the opening. The net used for inguinal hernia is an acute-angled triangle with the base turned toward the median line.

¹ Phila. Med. Jour., Nov. 22, 1902.

² Annals of Surgery, Nov., 1902.

There is a small aperture left in the base for the passage of the spermatic cord. It rests upon the internal oblique above and is sutured to Poupart's ligament below. Meyer has used the method three times with satisfaction. The patients were all very stout and the local conditions gave little promise of cure by the ordinary methods. One patient died of some other condition and the two others have gone for periods of 18 and 8 months without relapse. There has been no serious inconvenience from the presence of the truss.

J. A. Bodine¹ recommends **local anesthesia in the radical cure of inguinal hernia**. His remarks on the subject are based on 48 cases. The secret of success in this work is cocainization of the hypogastric branch of the ileohypogastric, the inguinal branch of the ilioinguinal, and the genital branch of the genitocrural nerves. These nerves possess intercommunicating branches, and this fact explains why the operation may be completed with comparatively little pain after cocainization of the ileohypogastric though the other two are not identified. When operating under local anesthesia, it is important not to carry the lower end of the incision too far down, as when this is done vessels are sure to be divided which will require ligation. When a bloodvessel is cut or tied in cocain work, it produces acute pain. Of the cases here reported, 43 were non-strangulated and 5 were strangulated. Many of the cases presented local complications which required considerable time and manipulation. In 18 cases there was entire absence of pain; in 28 the pain may be characterized as moderate; and in 2 it was acute when the neck of the sac was ligated. In 3 cases of double hernia which are classified as moderate in pain the second side was done with local anesthesia at the patient's request.

Alexander Lyle² relates an experience with **cocain in the radical cure of hernia** extending over 15 cases.

Eckstein³ reports 2 cases in which he has employed **paraffin injections for the cure of hernia**. The first patient was a girl 18 years of age who presented 2 small inguinal hernias. That on the right side had existed for a year and a half and that on the left for only 2 weeks. Under cocain-anesthesia between 4 c.c. and 5 c.c. of paraffin was injected into the left external abdominal ring. Within a few days the right side was treated in the same way. Each injection successfully occluded the inguinal opening and controlled the hernia. Since the operation the patient has done heavy work, and an examination 2 months later showed that both hernias were perfectly retained and the patient suffered no discomfort. She wore a truss on the right side for a short time after the second injection, but soon laid this off. The second case was a small umbilical hernia in a boy 9 years of age. The patient suffered considerable pain. When the hernia was reduced, the hernial ring admitted the tip of the finger. In this case 6 c.c. of paraffin was used. The paraffin mass was held in place for a few days by means of an adhesive strip, and the hernia did not recur. [These two cases are the only ones with which we are

¹ Med. Rec., Feb. 14, 1903.

² N. Y. Med. Jour., May 30, 1903.

³ Wien. klin. Rundsch., No. 48, Nov. 30, 1902.

acquainted in which this method of treatment has been employed, and we feel that it should not be generally recommended, and that if it fails it may interfere with a subsequent operation for the cure of the hernia. We have had some experience with tissues infiltrated with paraffin, and find them very difficult of manipulation.]

A summary of the history of the **radical cure of hernia** is given by A. E. Benjamin,¹ with a discussion of the modern methods of operating, in which the author describes and illustrates an original modification of Bassini's operation. The sutures employed for all the structures are of silkworm-gut, so arranged as to be easily withdrawn. A great advantage claimed for the operation is that there are no sutures for the tissues to absorb, and as the sutures are tied over gauze rolls, the danger of necrosis from too much constriction of the tissues is overcome.

Verhoef² discusses **the accidental wounding of the bladder in operations for hernia**, and reports 2 cases. In one of these a portion of the bladder was in the sac, but in the second it was not. The bladder is in danger of being wounded when the neck of the sac is being isolated, ligated, and divided. It is pointed out that the internal surface of the sac is in close contact with the bladder, and may in fact be closely attached to this organ; therefore when the sac is forcibly dragged down for the purpose of applying a ligature, the bladder may be included and injured. When an unusually thick layer of fat which cannot be readily dissected away from the sac is encountered, the surgeon should be on his guard lest he injure the bladder. If the urine be quite free from microorganisms and the wound be strictly extraperitoneal, Verhoef departs from the usual practice under such circumstances and advises drainage of the bladder with no attempt at suture. [It is difficult to understand what advantage is to be obtained by drainage of the bladder as here recommended. It would seem to us that its closure and fixation to the abdominal wall with gauze drainage applied over the point of suture would be a preferable procedure and render the subsequent completion of the radical cure of the hernia easier.]

J. B. Harvie,³ under the head of **hernial complications**, reports an interesting case in which the **entire bladder** was found in the hernial sac. Before operation it was thought that the condition was one of strangulated hernia complicated by a hydrocele. The tumor was a large one, but contracted in its center, giving an hourglass shape. The upper part of the mass was tender, but the lower part was not so sensitive. The patient had had a reducible hernia for 10 years, but had never worn a truss. It became irreducible on the day before operation in an unsuccessful attempt to evacuate the bowels, when the patient felt that the hernial mass had suddenly become greatly increased. Attempts at urination from this time on were frequent, but only a few drops were passed. Subsequently he developed all the symptoms of strangulated hernia. About 7 inches of gangrenous small intestine was found in the

¹ Jour. Am. Med. Assoc., April 25, 1903.

² Jour. de Chir. et Ann. de la Soc. Belge de Chir., No. 2, 1903.

³ Amer. Med., April 4, 1903.

sac and resected, an anastomosis being made with the Murphy button. The remaining mass was then examined and a small opening made in it which showed it to be the bladder. Considerable difficulty was experienced in reducing this organ, but it was finally accomplished and the patient made a good recovery. Other cases of hernia of the bladder which have been reported are referred to.

Collier¹ reports a case of a boy 2 years of age who was treated for **double congenital hernia**. On the right side the **bladder** was found in the sac, and on the left side the **cecum and appendix**. The interval between the operations was 3 weeks. The hernias were both reducible, but could not be controlled with a truss. The patient made a good recovery.

Schütz² is a strong advocate of the operation for **hernia of the linea alba**, even when the condition gives rise to no pain or trouble. The only conditions under which operative treatment might be regarded as contraindicated would be those in which the hernia is associated with emaciation from chronic disease or with some disease of one of the abdominal viscera. The abdominal bandages made for the purpose of controlling these hernias are generally unsatisfactory, as they usually retain them for a short time only, and are not able to withstand coughing or sneezing. The author is careful to call attention to the fact that the pain and dyspeptic symptoms so often accompanying this form of hernia may be of neurotic origin, and consequently may not disappear promptly and completely after operation.

W. H. Conant³ deals with the question of **operation for umbilical hernia** and pays particular attention to this condition occurring in stout adults. His views are summarized as follows: "(1) Umbilical hernia in children as a general rule gets well with the use of a truss. (2) Strangulated umbilical hernia should be operated on like any other hernia. (3) Radical umbilical hernia should be operated on if the patient will give consent. Otherwise, a well-fitting truss should be constantly worn, day and night. (4) Irreducible hernia should be operated unless there is some marked contraindication, like serious lesion of the kidney or heart. Age, and size of tumor need be no bar to an operation. (5) The preferable operation should combine rapidity of operation with diminution of shock, both by diminishing the hemorrhage and also the length of time that the patient has to be under an anesthetic. (6) Cocain should be used when ether is contraindicated."

Priestley Leech⁴ presents the notes on a case of **strangulated left duodenal (retroperitoneal) hernia** occurring in a young man 26 years of age. The symptoms of strangulation were slow in development, but within a few days became very marked. No cause could be found for the obstruction, and as enemas and other treatment failed to relieve the condition a laparotomy was resorted to. When the abdomen was opened, the small intestine was seen to be moving under the mesentery and a diagnosis of retroperitoneal hernia was easily made. The mouth of the

¹ Lancet, June 6, 1903.

² Boston M. and S. Jour., Oct. 9, 1902.

³ Wiener Klinik, April, 1903.

⁴ Lancet, June 6, 1903.

sac looked obliquely upward and to the right, and the anterior and lower margin was thickened and rigid. The finger could be passed into the sac and about a yard of intestine was withdrawn; the abdomen was closed and the patient made a good recovery. The author thinks that a diagnosis of the condition might have been made had it been thought of, since there were a history of two previous attacks of partial obstruction, the presence of a more or less central tumor, and pain paroxysmal in character. Leech believes that the obstruction in this case was due to a twist in the bowel, as it was certainly not due to constriction at the mouth of the sac, since the finger could readily be introduced before the gut was withdrawn and as there was no indication of constriction of the bowel. The sac in retroperitoneal hernia is a congenital condition, and probably always contains more or less intestine; should the amount of intestine in the sac become increased and distended, or should the intestine usually contained in the sac become more distended from some indiscretion in diet, increased peristalsis occurs and twisting may easily take place, leading to obstruction. As the inferior mesenteric vein lies in the neck of the sac, one would hesitate to cut the margin; and for the same reason no attempt was made to close or to obliterate the mouth of the sac. The author approves of the suggestion of Moynihan of describing these hernias as left and right duodenal; at present they are described under a great many different names.

Andrews¹ describes a case of **hernia into the fossa duodenojejunalis** which was discovered on the dissecting table. The whole of the small intestine, with the exception of the lower 6 inches on the ileum, was found in the sac. The subject was an old man.

Moschcowitz² deals with **inguinosuperficial hernia (Kuester)** and reports a very interesting case of this type. The patient was 28 years of age. The left testicle had never descended; it had occupied the position just outside the external ring. After adolescence the testicle descended about an inch, and its descent was accompanied by considerable pain, which the patient learned to relieve by pushing the organ back to its original position. Its descent and the accompanying pain became of such frequent occurrence that the patient was advised to wear a truss, the pad of which would lie on a plane above the testicle. It was found, however, that this only increased his suffering, and he therefore reversed the instruction which had been given him and wore the truss below the testicle, and in this way derived great comfort. In spite of the truss the testicle occasionally slipped below the pad. This accident was always accompanied by sharp pain, which was relieved only when the testicle was restored to its former position. The testicle slipped below the truss 26 hours before admission to the hospital and the patient was seized with sharp pain in the left inguinal region which was accompanied by nausea. When an attempt was made to restore the testicle, it was found impossible to do so. It was also noticed that there was a large swelling above the testicle. Upon admission there was seen and felt a smooth, ovoid, painful and tender mass about the size of a goose-egg parallel with

¹ Lancet, Jan. 24, 1903.

² Med. Rec., Jan. 10, 1902.

and above Poupart's ligament. The mass could be divided into two portions, the inner and inferior being smaller, firmer to touch, and distinctly more tender. The upper and outer half presented distinct fluctuation. A diagnosis of torsion of the spermatic cord was made and immediate operation done. When the tumor was exposed it was found to consist of two portions—the lower and anterior the testicle, and the upper and posterior a hernia containing strangulated omentum and considerable fluid. The testicle lay within the hernial sac. In other words, the hernia was of congenital origin. A tunica vaginalis was formed for the testicle from the sac and the testicle carried down into the scrotum and fixed there. The sac was excised and a Bassini operation performed. The wound healed primarily, and 8 months after operation there was no evidence of a recurrence of the hernia. The reader is referred to the classic article of Kuester, in which the condition is most minutely described. Its rarity is shown by the fact that the author has been able to add to Goebel's collection (1900) of 14 cases but 3 others. The predisposing elements in this variety of hernia are an undescended testicle and an open processus vaginalis. [At the Pennsylvania Hospital during the summer of 1903 Gibbon operated upon 2 cases practically identical with that of Moschcowitz. There were symptoms of strangulation in each, and the sac in one contained omentum and in the other a small knuckle of bowel. The testicle was removed in each case and the patients made good recoveries. These cases will be reported in detail later. DaCosta operated on a similar case in the Jefferson College Hospital.]

A brief discussion of **properitoneal hernia** with a report of an interesting case is presented by Howlett.¹ The patient, a man of 48, was admitted to the hospital having vomited for 5 days, during the last 2 of which the vomited material had been of stercoraceous character. The patient gave a history of having been troubled with a "lump" on the left side which presented itself midway between the anterior superior spine of the ilium and the middle line. He said this lump disappeared when he lay down. For its control he wore a belt. The left inguinal canal seemed somewhat prominent, but the parts were soft to the touch and no hernia could be felt. A large horseshoe flap with its base over the internal ring was turned down and the internal ring thoroughly exposed. The canal was found to be perfectly normal except for a mass of varicose veins in the cord. On making pressure upward with the finger-tips at the site of the internal ring a tense sac could be felt. The abdominal wall was incised over it, and when the sac was opened some foul bloody fluid escaped, together with a mass of gangrenous omentum. The omentum was excised, and in the bottom of the sac was found a coil of gangrenous bowel. The constriction at the neck of the sac was divided and the healthy bowel drawn out. The gangrenous portion was resected and an anastomosis made with a Murphy button and the bowel dropped back into where was supposed to be the abdominal cavity. The patient was in a very grave condition and 4 pints of saline solution was transfused into the arm. Toward the close of the next day stercoraceous

¹ Quarterly Med. Jour., Aug., 1902.

vomiting recommenced, and in spite of stimulation the patient died 48 hours after the operation. A limited postmortem examination revealed the interesting fact that there were two sacs, one which was opened at the operation, and at the neck of which the previous obstruction had taken place, and a second very large one, which was found between the peritoneum and the transversalis fascia, extending downward and inward to the pelvis and side of the bladder. In this second cavity lay the resected bowel and ligated omentum. The obstruction at the ring appeared to be of recent date, and Howlett inclines to the view that it was caused by the dragging on the omentum at the operation, resulting in plugging of the ring, and thus giving rise to the second set of symptoms of strangulation. The opening from the abdominal cavity into the larger internal sac was quite large. Reference is made to the various forms of interstitial hernia, and especially to Moynihan's work in this condition.

A. Webb Jones¹ describes a rare case of **lumbar hernia** which came under his care. Such hernias protrude through the triangle of Petit, that is, the interval between the latissimus dorsi and the external oblique muscles. In many of the cases the abdominal wall at this point has been weakened by the formation of an abscess. Jones's patient was a well-developed male Soudanese aged 45. The hernia, which was on the right side, had existed for 4 or 5 years, and lately had caused considerable trouble from local pain and tenderness with constipation and dyspepsia. The hernia was oval in shape and rather irregular in outline, extending from the level of the iliac crest inward and upward toward the spine and overlapping the lower three or four ribs. It gave the impression of being composed largely of fat, but on reduction, which was easily accomplished, a distinct gurgle was felt. The impulse on coughing was well marked. In the left lumbar region there was a slight undue fulness that gave rise to no symptoms, but it is thought it might be the forerunner of a hernia on this side. Jones operated on the right side and removed a large amount of fat and reduced the colon to the abdominal cavity. The edges of the latissimus dorsi and external oblique were united with silkworm-gut and the wound closed. The recovery was uneventful. Mastin collected 25 cases of lumbar hernia. Three of the 25 cases occurred in infants, but one of these followed an old psoas abscess. By far the gravest characteristic, however, of this variety of hernia is its very marked tendency to produce symptoms of local pain, constipation, or even strangulation. Of the 25 cases referred to above, no less than 4 became strangulated, 5 are said to have been from time to time the cause of vomiting, colic, or constipation, while 6 only are stated definitely to have given no trouble; the rest are without details. One case was bilateral and associated with an inguinal hernia. In two instances the diagnosis was at fault and the bowel was damaged, the surgeon being under the impression that he was incising an abscess. No sac was discovered in the case here reported, and in only a few instances of those reported was the presence of a sac noted.

Three cases of **unusual hernia** are reported by Sir Wm. J. Collins.²

¹ *Lancet*, Sept. 13, 1902.

² *Lancet*, May 23, 1903.

Two of these were Richter's hernias. The third case was one of a woman 44 years of age who was admitted with what was supposed to be an irreducible and painful femoral hernia. When the hernial sac was exposed, the finger of the operator detected a sharp pointed foreign body, which upon removal proved to be a piece of bone $1\frac{1}{4}$ inches long, varying from $\frac{1}{8}$ to $\frac{1}{4}$ of an inch in width. This bone transfixes the sac. The sac was removed, the wound was closed, and the patient made a good recovery. There was no evidence of perforation of the bowel and there was no bowel found in the sac at the time of the operation; it is therefore impossible to explain how the bone reached the position in which it was found.

Rake¹ reports a case of **strangulation of vermiform appendix in the right femoral ring**. The appendix became strangulated and suppurated, forming a large abscess which was incised. On the sixth day after incision a sloughing mass presented in the abscess-cavity, was removed, and was easily recognized as the appendix. A slight fecal discharge kept the wound open for some time, but it finally healed.

Jeffery² reports a somewhat unique case of **hernia of the cecum and appendix** occurring in a child $2\frac{1}{2}$ years of age. The hernia appeared at the age of 2 months and was reducible until March, 1902. At this time there occurred a somewhat acute inflammation of the contents of the hernia, the mother stating that it became swollen, painful, and red, and that later an abscess formed and burst externally, discharging quantities of pus for about a fortnight. The child recovered with a fecal fistula. The patient came under Jeffery's care in August, 1902, at the age of $2\frac{1}{2}$ years. The fistula opened in the right side of the scrotum. The inguinal canal was opened and the hernial sac found to contain the cecum and appendix. The internal site of the fistula was discovered in the cecum near the base of the appendix. The bowel was freed from adhesions, the appendix removed, and the edges of the fistulous opening cut away and sutured. The patient made a good recovery.

The **coexistence of hernia and hydrocele** Vittorio Remedi³ has encountered 25 times, and presents a careful study of the condition. In the 25 cases which were carefully studied as to the relationship between hydrocele and inguinal hernia only 3 did not show a hernial protrusion into the vaginal process at the level of the internal inguinal ring. In an earlier contribution Remedi stated that there existed a constant relationship between hydrocele and the incomplete obliteration of the vaginal peritoneum. The 3 cases referred to refute this statement. The author expresses the hope that other surgeons will observe the relationship between the two conditions and report their results. In order to make a thorough examination the incision for hydrocele must be extended toward the inguinal canal in order to determine whether the vaginal process of the peritoneum is obliterated. If it is not, it should be excised in order to prevent the occurrence of a subsequent hernia.

A. E. Barker⁴ in two clinical lectures discusses the **results of operations for strangulated hernia** and the **treatment of gangrenous her-**

¹ Ann. of Surg., Dec., 1902.

² Gaz. degli Osped., March 8, 1903.

³ Brit. Med. Jour., Nov. 29, 1902.

⁴ Lancet, May 30, and June 6, 1903.

nias by enterectomy. The first lecture is based upon a table of 406 consecutive operations performed for strangulated hernia at the University College Hospital. The figures presented show that the number of cases operated on for strangulated hernia in this hospital has each year increased, and that during the last 10 years the average number has been just twice as great as it was 20 years ago. This is partly due to the fact that taxis is now less frequently resorted to in severe cases than formerly. In the first series of years taken 36 cases were treated by taxis; in the second equal number of years, 52; in the third, 19; in the fourth, 6; and in the last, none at all. Barker doubts whether in any given case of strangulated hernia taxis ought ever to be employed **except in the very recent cases and among aged patients in a state of great weakness.** It is impossible until the sac is opened to tell the amount of damage done to the intestine by strangulation, and even when the sac has been opened the bowel is frequently put back in the belief and hope that it is sound and viable, and yet death has frequently resulted from perforation or peritonitis. The duration of the strangulation has been shown to be an unsafe guide as regards the propriety of replacing the strangulated bowel. Many of the cases in which it was comparatively short have succumbed to peritonitis after reduction, while others have recovered when the strangulation has lasted for days. Of the 406 cases considered in this paper, 127 ended fatally, a mortality of 31.2 %. Considering these cases, however, in series of years, it is shown that the mortality-rate has been reduced more than one-half during recent years. This is not due to the fact that cases are sent into the hospital in better condition, since the number of cases in which the condition of the patient and bowel were so bad as to forbid anything more than an artificial anus being made remains almost equal for each of the series of years, and was exactly the same for the first and the penultimate. A study of the post-mortem examinations made in the fatal cases operated upon shows that death in the majority was due to general peritonitis spreading from the reduced gut. Up to the summer of 1899 no single case of successful enterectomy for gangrenous hernia appears. Since then to the end of March, 1903, there have been 3 cases of artificial anus with 2 deaths, and 7 cases of primary enterectomy with 4 deaths. Barker discusses the treatment of gangrenous hernia at considerable length. The elements of danger in a gangrenous hernia are enumerated as follows: "(1) The gut is destroyed by necrosis over a greater or less surface and therefore it cannot be returned into the abdomen; (2) the dead portion is septic in the highest degree; (3) the fluid of the sac, if there be any, is highly septic and may run back into the abdomen and infect it if the constriction has been divided before the sac has been well cleansed; and (4) the condition of things within the abdomen is also fraught with risk." Attention is called to the fact that the bowel above the constriction is loaded with retained fecal matter which is virulent in proportion to the time it has been pent up in a stagnant condition. The bowel is distended by this fluid often to an enormous extent, is paralyzed, and frequently its structure is altered, the mucous membrane being inflamed and even ulcerated from

the point of obstruction upward sometimes for a number of feet. It is clear that the same infection will take place sooner or later within the abdomen from the unbroken bowel above the constriction if the evacuation of the retained fermenting feces be not provided for. Because of this condition of the bowel Barker urges extensive resections, and also that the bowel be thoroughly emptied. Absorption from the retained contents is a great additional danger. The irritating properties of these contents is shown in the inflammation of the skin which follows the formation of an artificial anus. Although many surgeons recommend the establishment of an artificial anus in cases of gangrenous hernia, Barker rather advocates the performance of a primary resection and anastomosis. At the University College Hospital in a series of years reaching down to date, out of 20 consecutive cases of formation of an artificial anus for gangrene only 2 ultimately recovered. In those cases of gangrenous bowel in broken-down individuals who are almost moribund the law of establishing an artificial anus must still hold good, any long operation or any prolonged general

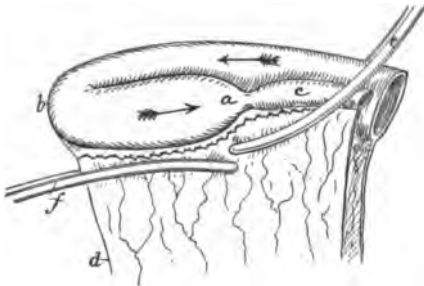


Fig. 44.—a, Constriction; b, proximal distended gut; c, distal contracted gut; d, mesentery; e, Doyen's clamp on both loops; f, Doyen's clamp on mesentery. The folded loop here represented is for convenience of drawing only a short one (Barker, in *Lancet*, May 30, and June 6, 1903).

anesthesia being contraindicated. But in those instances in which the patients are in tolerably good general condition, although the state of the intestine is hopeless, it is thought that a wide-reaching resection of the bowel offers the best prospect of recovery.

The author is glad to see that the tendency to postpone operation and the pernicious practice of drenching cases with strangulated hernia with

purgatives is less widespread than formerly. The most imminent danger to the patient with a greatly damaged or actually gangrenous loop of intestine lies in the condition of the bowel for the 3 or 4 feet above the constriction. If this is simply put back or an artificial anus made, the risks are enormous. The great point is to remove at once the contents as well as the diseased bowel, and to make the suture junction in relatively sound and clean gut. Attention is called to the fact that it takes very little longer to excise a large portion of the bowel than it does to excise a small portion. A number of cases are referred to illustrating the author's attitude toward immediate primary resection. It is Barker's custom in doing a resection to fold the bowel and its mesentery upon itself and grasp the two layers of mesentery, as is shown in the accompanying illustration (Fig. 44), with long Doyen forceps. The distal end of the bowel is also clamped with the Doyen forceps and both layers of mesentery then controlled and approximated by a number of sutures. The distal end of the gut is then separated from the mesentery and allowed to hang over the edge of the table and empty itself while

the remaining mesentery is divided. In this manner a large portion of the bowel proximal to the constriction, and which contains the objectionable material already referred to, is also thoroughly emptied. When this is complete, a second Doyen forceps is applied to the point of proximal division and the diseased bowel removed and an anastomosis made by two rows of sutures, one involving the muscular and serous coats, and one the mucous coat. Since Barker began to employ this method of procedure in 1899 he has done 7 enterectomies for gangrenous hernia; and of these, 5 have recovered. One of the fatal cases died from obstruction due to an old fibrous band pressing on the bowel after its return. The second death was due to a slowly developed peritonitis starting from the remains of the infected sac, which unfortunately had not been drained at the time of the operation, and which it was difficult to shut off by suture from the abdominal cavity.

An analysis of 110 operations for strangulated hernia is presented by William Thorburn.¹ These patients were all operated upon in the Manchester Royal Infirmary between 1889 and 1900. Of these, 55 were inguinal, of which but 5 occurred in females; 37 were femoral, of which but 3 occurred in males; 17 umbilical, 4 in males; and 1 ventral. Strangulation was more common on the right side. The age varied greatly, the oldest patient being 84. The youngest patient suffering from strangulated femoral hernia was 21 years of age. One of the cases of strangulated umbilical hernia occurred in a male infant 2 days old; this patient recovered promptly after operation. The rarity of this condition is referred to. Two of the successful cases in this series had been reduced *en masse* before admission and were treated by median laparotomy. All of the cases in the series contained intestine in the sac. In one case of right inguinal hernia in a child the vermiform appendix and cecum were found in the sac, and in one adult the entire cecum was present. In no case were organs other than intestine and omentum found in the sac. Gangrene or perforation of the bowel occurred in 10 instances. The mortality of the whole series was 24.54 %. The author has collected statistics of St. Bartholomew's, St. Thomas's, and the Middlesex Hospitals for a number of years, and finds that the mortality-rate is practically the same as his own, being 24.58 %. Attention is called to the fact that in the author's series the first 55 cases showed a mortality of 29 %, and the second 55 of only 20 %, and these figures are practically duplicated in the statistics of the hospitals referred to. In 9 of the 27 fatal cases the intestine was gangrenous or perforated by ulcers at the time of operation; and in 2 of these there was a general peritonitis. Of the remaining 18 cases, 4 were fatal within 24 hours from shock or intoxication. One patient, a man aged 84 years, died on the eighth day from pneumonia. Of the 10 infants and young children in this series, none died. In 8 of the patients whose condition was very bad the intestine was merely opened and left in the wound after division of the constriction; of these, 7 died. The 2 cases in which reduction *en masse* was performed, and which were operated upon later through a median incision, recovered.

¹ Brit. Med. Jour., April 25, 1903.

A successful operation for a **strangulated femoral hernia of 52 hours' duration** occurring in a woman 90 years of age is reported by Neave.¹ The patient made a good recovery in spite of the fact that the operation was done without any of the modern conveniences of aseptic surgery.

A case of **bilateral strangulated hernia in an infant 10 weeks old** is reported by Kellock.² On March 8 the child was operated upon for a strangulated right inguinal hernia. A hernia was found in the left inguinal region 2 days later which was easily reduced. The child was discharged from the hospital on the eleventh day after operation, but 4 days later was readmitted with strangulation of the left side. The patient recovered from both operations.

A. B. Mitchell³ reports a case of a man 57 years of age upon whom he operated for **old-standing irreducible inguinal hernia** which had **given rise to repeated attacks of obstruction**. The mass was so large that it was found impossible to reduce it. Its size was the result of an overgrowth of fat between the layers of the mesentery. A resection of all the intestine in the sac was then done and the portion removed was afterward found to measure 6 feet. The patient made a good recovery, and 16 months after the operation showed no evidence of a recurrence.

The literature of **congenital hernia of the liver into the umbilical cord** is freely quoted in an article by J. W. Bullard,⁴ who also reports a case of his own occurring in a male child weighing 3½ pounds. An attempt at radical operation was made when the child was 12 days old, but owing to extensive adhesions it was necessary to abandon the operation, and the child died 20 hours later. Reference is made to a number of other cases, however, in which the operation has been successful. It is maintained that it is advisable to do the operation in these cases as soon after birth as possible, as delay, with the consequent changes in the cord and the amniotic coverings of the sac, is likely to lessen the chances of a favorable result.

DISEASES OF THE LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN.

Arnott,⁵ of St. Helena, reports a unique case of **liver abscess occurring in a child 2½ years of age**, a time of life at which the disease was supposed not to occur. The child was admitted with a history of a neglected attack of dysentery. The stools were typically dysenteric in character and the patient also presented signs of commencing tubercle in the lung. Great improvement followed the open-air treatment and the dysentery disappeared. The temperature remained normal for 9 days, when it again rose and continued irregular. There was nothing demonstrable in the chest to account for the temperature, but the liver was greatly enlarged and tender. Vomiting became a troublesome

¹ Lancet, Oct. 15, 1902.

² Lancet, July 5, 1902.

³ Brit. Med. Jour., Sept. 27, 1902.

⁴ Amer. Med., Nov. 8, 1902.

⁵ Brit. Med. Jour., Jan. 24, 1903.

symptom and the child was very much exhausted. A trocar was introduced into the liver through the tenth interspace in the anterior axillary line and 12 ounces of pus were withdrawn. The withdrawal of the pus was followed by a drop in temperature from 103° to 99° and a cessation of the vomiting. The abdominal distention also disappeared. Soon after the operation the child developed typical tuberculous meningitis and died 6 days after the opening of the abscess.

Captain Keble¹ reports from India 4 cases of **abscess of the liver** occurring in English soldiers, all of whom recovered. Of these patients, 3 were apparently suffering from malarial fever, but the fever would not yield to quinin, and later the symptoms of abscess developed. In the first case the only indications of liver-abscess were a fluctuating temperature and sweats. In this case but slight enlargement of the liver was noticed and there was no pain or tenderness. Pus to the amount of 10 ounces was evacuated through an incision made between the seventh and eighth ribs in the anterior axillary line. In the second case the diagnosis was very doubtful and the condition was not definitely diagnosed until an aspirating needle was introduced into a pulsating tumor which appeared just beneath the costal arch to the left of the median line opposite the eighth and ninth cartilages. The liver was not enlarged nor was it painful or tender, but 22 ounces of pus was evacuated. The abscess in the third case was drained as in the first, 15 ounces of chocolate-colored pus being evacuated. In each of these 3 cases the abscess-cavity was washed out with mercuric chlorid solution. The fourth case was one of liver-abscess which opened into the bowel, and in this way recovery took place. [We would hesitate to wash an abscess-cavity with mercuric chlorid solution because, in the first place, the pus is often sterile in abscess of the liver, and if it is antiseptic irrigation can do no possible good; second, because even if the fluid contains bacteria, the germicide will fail to destroy those in the abscess-wall; third, because the irritant germicide may break through encompassing barriers and disseminate infection.]

Cohen and Gibbon² report a case of **tropical abscess of the liver** and present a brief discussion of the subject. The patient was a man 30 years of age who developed dysentery 3 years previous to admission, while residing in South Africa, from which he did not recover until his return to America. About a year before his admission to the hospital the patient noticed a swelling in the hepatic region which accompanied a recurrence of the bloody stools. The latter symptom continued intermittently. The liver continued to enlarge, and it was on this account that the patient applied for treatment. The hepatic enlargement was enormous, extending from the fourth interspace nearly down to the iliac crest. The patient complained of nothing save the discomfort due to the size of the tumor. The elevation of temperature was insignificant and there was no history of previous chill or fever. The leukocyte count was 13,400. There was no tenderness over the liver, although there was a point just below the edges of the ribs which seemed to fluctuate. The

¹ Brit. Med. Jour., Sept. 6, 1902.

² Am. Jour. Med. Sci., Feb., 1903.

amebas were not found in the stools, although repeated examinations were made. The character of the enlargement, its smoothness, and the absence of tenderness and a sense of fluctuation at its most prominent part caused hydatid disease to be seriously considered. The history of dysentery, however, and the fact that the patient stated that an exploring needle which had been introduced revealed pus seemed to indicate an abscess. The liver was exposed over its most prominent part, just below the costal border, the peritoneum was not found adherent, and there was no blood in the abdominal cavity. An aspirating needle was introduced into the liver and a quantity of thick brown pus escaped. The general abdominal cavity having been thoroughly walled off from the point of puncture by large gauze pads, the abscess was freely opened by means of the Paquelin cautery. An enormous quantity of pus was withdrawn and the liver became so contracted that it was necessary to make a second transverse incision extending from the first in order to thoroughly drain the abscess. The patient made an excellent recovery and has greatly increased in weight. The liver rapidly contracted. Drainage was continued for about 3 months. No amebas were found in the pus, although it was repeatedly examined. Attention is called to the frequency of amebic dysentery occurring in American and English soldiers in the tropics. The ameba can frequently be found in scrapings from the abscess when not found in the pus itself. Although multiple abscesses of the liver are usually of pyemic origin, the fact that about one-half of the liver abscesses occurring in tropical countries are multiple produces the belief that the ameba is more frequently responsible for multiple abscesses than is generally supposed. The abscess may occur at any part of the liver, but is most frequently situated in the right lobe near the anterior or posterior border. If left to itself, the abscess will break either into the pleural cavity, the lung, or the abdominal cavity. Many cases have reached recovery after rupture into the lung. The mortality of liver-abscesses without operation is between 90 % and 95 %. The treatment consists in thorough drainage through an opening made either anteriorly, as in the case reported, or posteriorly after resection of one or more of the lower ribs. The aspirating needle should be used only when the surgeon is prepared at once to operate in case pus is found. Otherwise there is danger of infection of the peritoneum or pleura by the withdrawal of an infected needle, and the possibility of the escape of a small amount of pus if the abscess is very tense. The needle is of the greatest value after the liver is exposed, when it not only discovers the pus, but also may be employed as a guide to the knife or cautery. The operation may be done either in one or in two stages, that is, immediate drainage or secondary drainage after the liver has become adherent to the parietes. Curetment of the abscess-wall seems questionable, and care should be used in introducing a drainage-tube to see that the end of the tube does not rest on the abscess-wall, since such pressure may produce necrosis and perforation at this point. The stitching of the liver to the abdominal or chest wall does not seem necessary if the drainage-tube is thoroughly surrounded by gauze. [In a case recently operated

upon by Da Costa the left lobe was involved. The patient had never been out of the United States, had never had dysentery or chronic diarrhea or typhoid fever. The leukocyte count was only 8000. There had been no chills or sweats and the temperature was 100° in the evening. He had lost much flesh and complained of pain and tenderness in the hepatic region. The liver was much enlarged. The abscess contained a quantity of chocolate-colored fluid which contained no amebas and was sterile. Recovery followed drainage.]

Vachell and Stevens¹ describe 2 cases of **carcinoma of the liver**, each presenting interesting clinical and pathologic points. The first patient was a negro 36 years of age who was treated in the Cardiff Infirmary. The patient had worked until 8 weeks before his admission, when he first noticed that his abdomen was swollen. He had no discomfort whatever and there was no history of malaria, syphilis, or alcoholism. He was deeply jaundiced. There was no fever. The abdomen was markedly ascitic and the liver was greatly enlarged, occupying the whole upper part of the abdomen, was hard and nodular, but was not tender. The patient sank rapidly and died 5 days after admission. At the autopsy the liver was removed and found to weigh over 17 pounds. The whole organ was involved in a malignant growth and there was no adhesion to surrounding parts. All the other organs were quite normal with the exception that there were 3 small white nodules on the visceral pleura and a small nodule in one of the bronchial glands. Microscopic examination showed an infiltrating spheroidal-celled carcinoma. The brief duration of the illness is of interest, although the average duration of primary carcinomas of the liver is but 12 weeks. The absence of other symptoms than jaundice and ascites is also worthy of note and rather exceptional. Primary carcinoma of the liver is rare, only about 4 % of all cases of cancer of the liver being primary. Before assuming that such a growth is primary, it is necessary to make a careful and detailed search for a primary source in another part. The absence of fever in the case reported was exceptional, as was also the freedom from pain and tenderness. The second case was that of a man 56 years of age. The interesting point in this case was that the malignant growth of the liver had its origin in an exceedingly small primary growth in the pylorus. This case illustrates the point which the authors wish to make, that it is necessary to make a careful examination of other organs before assuming that liver cancer is primary. The condition in this case very closely resembled alcoholic cirrhosis. There was a marked history of alcoholic excess; there was no jaundice, but well-marked ascites. The liver was not palpable and there was an absence of both pain and tenderness. There was slight hematemesis 3 days before death, but no melena.

Richard Jones² reports a case of **suppurating hydatid cyst of the liver complicating pregnancy**. The patient was a primipara 36 years of age. During gestation she had periodic attacks of spasmodic pain in her right side accompanied with vomiting and jaundice. The attacks were sudden in onset and quickly disappeared. Previous to her preg-

¹ Brit. Med. Jour., Feb. 14, 1903.

² Brit. Med. Jour., April 11, 1903.

nancy she had had no symptoms at all. She was delivered at term and did fairly well until the third day afterward, when she had an attack of pain and chilly sensations. On the fourth day she had a distinct chill and very acute pain in the right side with vomiting. There was nothing to indicate hydatid disease except the situation of the pain. The liver was plainly enlarged; the other abdominal organs were normal. Tenderness was marked in front and to a less degree at the side. The lower half of the right thorax was dull and there was an absence of breath-sounds. The intercostal spaces corresponding to the dullness were bulging. The hand placed over this area detected distinct crepitation. The cyst was exposed through the chest in the usual manner and the patient stood the operation well. The cyst communicated with a large bile-duct and the flow of bile was profuse and continuous. The patient's death, which occurred on the fourth day, is attributed to this cause.

Kilvington¹ discusses **simple cysts of the liver**, reporting several cases which came under his observation, and reaches the following conclusions: (1) Most of them arise from dilated bile-ducts. (2) Mechanical obstruction, such as results from tumors and cirrhosis, is not the main cause, though it may assist other factors (these conditions are extremely common, whereas liver cysts are rare). (3) Some cysts are admittedly the result of a developmental fault, and he believes most of the large ones have the same basis, though the change is only in part of the liver, and progresses during extrauterine life. (4) The peculiar vascular and cirrhotic condition of these livers is another expression of a congenital error, and this obtains in the fetus and in some of the lower animals. (5) The occasional origin in the bloodvessels cannot be denied, and the change from blood-cysts to serous cysts is seen in other situations, and in nevi. (6) The development from dilated lymph-spaces is possible, though he cannot find the report of any case where this has been made out. (7) The fusion of vacuolated liver-cells to form a large cavity is of dubious occurrence. It is impossible for it to lead to the production of a space bounded by a definite fibrous wall, and lined by a layer of nucleated cells. The only change established as occurring when liver cells atrophy and disappear is the occasional formation of an angioma.

A remarkable case of **nail in the liver** is reported by Livingstone and Jubb.² The patient, a man 64 years of age, was admitted to the hospital for cancer of the rectum and died about 6 months later. The interesting disclosure of autopsy was a nail in the left lobe of the liver, which had penetrated the organ from below. The head of the nail was almost flush with the under surface of the liver and was covered with peritoneum. Judging from the somewhat extensive cicatrix on the under surface of the liver, it was thought that the nail was probably swallowed, and that, becoming jammed in an upright position at the pylorus, it gradually made its way through the stomach-wall. No trace of injury, however, could be found in any other organ than the liver.

¹ Intercol. Med. Jour. of Australasia, Dec. 20, 1902.

² Brit. Med. Jour., Sept. 6, 1902.

The nail was an ordinary iron one, $1\frac{1}{4}$ inches in length. During life there was no complaint of any other trouble than cancer of the rectum.

Keen and Fisher¹ make an interesting report of a case of **cirrhosis of the liver** 2 years after epiploexy performed for ascites. The patient was an Italian, 32 years of age. He was operated upon 8 weeks after the occurrence of the ascites and after having been tapped a number of times. In performing the operation Keen irritated the upper portion of the liver and spleen and the under portion of the diaphragm, and in addition sutured the omentum to the abdominal wall. After the operation the fluid reaccumulated and the patient had to be tapped a number of times. At the end of 6 months, however, the condition of ascites had entirely disappeared, and there has been no recurrence at the end of 2 years. The patient has gained considerably in weight and color, but still suffers excessively from pain in the splenic region. The spleen, which was very large at the time of operation, is if anything larger since. Although it has been suggested that this might be a case of Banti's disease, the other characteristic symptoms of this disease are not present.

Greenough² presents an exhaustive study of the literature relating to the **surgical treatment of cirrhosis of the liver** and has collected and summarized 105 cases. He eliminates 17 cases in which Talma's operation was done for ascites due to other causes than cirrhosis. Following is the author's summary of his paper: "(1) The condition known as biliary cirrhosis, with enlarged liver, jaundice, and fever and without ascites, is accompanied in a certain proportion of cases by an infection of the bile-ducts. The drainage of the bile-ducts by cholecystostomy is a proper operation for the relief of this condition when evidence of infection is present and symptomatic treatment has failed to effect relief. (2) Of 105 cases of liver cirrhosis which presented the symptoms of ascites, 42 % were improved and 58 % not improved by Talma's operation or one of its modifications. The mortality within 30 days was 29.5 %. Nine patients were improved in health 2 years after the operation. (3) The nine cases of continued relief presented no marked differences from the general character of all the cases. (4) The cases in which the liver was enlarged gave a lower mortality and a higher percentage of improvement than cases of atrophic liver. (5) Cases of suture of the omentum between the layers of the abdominal wall gave a lower mortality and a slightly higher percentage of improvement than cases where only peritoneal surfaces were brought in contact. (6) Drainage increases the danger of septic infection and peritonitis and is to be avoided. If necessary, tapping may be done after the operation. (7) The presence of adhesions or perihepatitis is of good prognostic import as regards the success of the operation. (8) The number of tappings before operation and the presence of edema of the feet and legs are of less prognostic importance than the general condition of the patient, the size of the liver, and the functional activity of the liver-cells. (9) Talma's operation or one of its modifications is of proved benefit in a certain limited number of cases of liver cirrhosis; primarily for the relief of

¹ Phila. Med. Jour., May 9, 1903.

² Am. Jour. Med. Sci., Dec., 1902.

ascites, and secondarily for the relief of other symptoms of portal congestion. (10) The dangers attending the operation are mainly due to the weakened resistance of the patient, rather than to the operation itself. The selection of cases suitable for operation demands more judgment than has been exercised hitherto. (11) The operation is not indicated in cases of ascites due to causes other than cirrhosis of the liver. (12) The operation is contraindicated in the presence of renal or cardiac disease and when good evidence does not exist that sufficient functional liver tissue remains to maintain life. It is also contraindicated when complications exist sufficient in themselves to make the result of operation uncertain." [The operation should be performed early before the development of chronic inflammation of the peritoneum.]

Arcoleo¹ has performed the operation of Talma 8 times for **ascites due to cirrhosis of the liver**. Three patients died shortly after the operation; 4 patients were neither improved nor injured by the operation, and in these a temporary relief of symptoms took place. Two of the patients were suffering from hypertrophic cirrhosis, and the operation in these resulted in marked temporary improvement. This is probably due to the fact that this form of cirrhosis is much less serious than the atrophic type. It is shown that these results correspond practically with those of a number of other surgeons. Mori presents an analysis of 37 cases: 13 patients died and 13 were cured; 10 remained stationary and 1 improved. Mongour puts the immediate mortality of the operation at 35 % and Frieschi places it at 45 %. The number of cases which have been operated upon is not yet sufficient to warrant the drawing of any very definite conclusions regarding the value of the operation. All operators are of the opinion that the operation should be done as soon as ascites develops, and that the patients who are already markedly cachectic and in bad condition should not be operated upon.

Thomas R. Neilson² reports a case in which he performed **Talma's operation for the relief of ascites due to cirrhosis of the liver**. The report is made 21 months after operation. The patient was in a grave condition at the time of operation and the ascites was very marked. He showed prompt improvement after the operation and 21 months later was in the best of health, having gained 23 pounds in weight.

Tansini³ reports a number of experiments upon dogs in which an attempt was made to **divert the portal circulation by direct union of the portal vein with the vena cava**. Of the dogs operated upon, 10 % lived, and were under observation for a number of months, during which time they became quite fat.

The present status of the **surgery of the gallbladder and bile-ducts** is presented by William J. Mayo.⁴ It is thought that the accepted percentage (5 %) of persons suffering from gallstones is too high, because the statistics are taken largely from almshouses and large public hospitals. The profession has grown so accustomed to looking upon colic as the one symptom of gallstones that the more chronic manifestations

¹ Rif. Med., Feb. 11, 1903.

³ Centrallbl. f. Chir., 1902, No. 36.

² Phila. Med. Jour., May 9, 1903.

⁴ Med. Rec., Feb. 21, 1903.

of cholelithiasis are frequently overlooked. The two elements which cause latent calculi to become active are infection and mechanical interference with drainage. Infections in the gallbladder may die out, especially those resulting from the colon bacillus, but this is not to be expected. It has been clearly shown that normal bile is free from micro-organisms. It is taken for granted, however, that all cases of "slumbering" gallstones contain bacteria encapsulated. The reputation of the various medicinal springs probably rests upon the fact that the water acts by keeping up a free circulation of bile which is so essential to the well-being of the host. The active gallstones as long as they have periods of latency are compared to the cases of chronic and relapsing appendicitis. Mayo favors the early removal of active gallstones. Of these cases Mayo and his brother had operated upon 250 out of a total of 454 operations upon the bladder and ducts up to December 11, 1902, with a mortality of less than 1 %. He has collected 2000 operations of this kind in the hands of 6 surgeons without a single instance of the reformation of gallstones. Delay in these cases of active gallstones with periods of latency breeds misfortune. Repeated infection with prolonged interference with drainage causes the walls of the viscus to become infiltrated with inflammatory products, and the connective tissue formed interferes with its elasticity under pressure and limits its power of contraction. At this stage the obstructing stone is forced through the cystic duct into the common duct, there to remain or pass out into the intestine, or it may become encysted in a thick-walled pouch composed of the remains of the gallbladder, causing recurring attacks of inflammation. Adhesions to surrounding structures may prevent fatal perforation, and spontaneous discharge of the infected fluid and incidentally of the calculi may take place. It is seldom that all of the stones are thus passed, and even if they are the adhesions remaining may be a prolonged source of distress to the patient. An operation at this stage is dangerous and the gallbladder can no longer be expected to return to the normal. It is in this class of cases that cancer of the gallbladder is most likely to occur. In the 454 operations referred to cancer of the gallbladder or bile-ducts occurred in 21 cases (5 %), and in nearly all a distinct history of previous colic was elicited. In every one of these cases in which the gallbladder was examined stones were found. It is stated that in no case was operation performed upon a patient who had passed stones by the bowel that the gallbladder did not contain more. In 49 cases stones were found in the common and hepatic ducts. Infection of the liver-ducts is the cause of death after operation in the majority of cases. This condition has been termed "hepatargia" by Eisendrath, and indicates the cessation of liver-function from degeneration of the parenchyma. In Mayo's experience this has been the cause of death in nearly one-half the fatal cases. The symptoms are chiefly nervous and usually sudden in onset and rapid in their course. The only safeguard when infective cholangitis is presented is the free drainage of bile to the surface. Cases are referred to which have been operated upon and in which no stones were found but only thick mucus and bile. There were 26 such cases in the present

series. The colics were undoubtedly due to plugging of the bile-passages with the tarry material with which the gallbladder is filled. In each of these 26 cases a careful but futile search was made for some other cause for the symptoms, but none found. Mayo has recently written to each of these patients to find out the present condition, and from the 23 letters received 19 replies; of these, 15 wrote that they were well, 2 improved, and 2 unimproved. Three died as a result of the operation, from hepatargia. This death-rate alone demonstrates that the infection is often more active than in gallstone disease. The ideal operation of removing the stones and closing the gallbladder is not approved, although it may be done in those latent cases in which the stones are found during other operations on the abdominal viscera. Whenever gallstones are in a state of activity, drainage is the operation of choice, and this drainage should be continued until the bile is normal. Gallbladders with thickened walls, and especially if the cystic duct has been obstructed, are liable to give trouble after cholecystotomy, and, if possible, the organ should be removed. The cystic duct should be tied only when the liver-ducts are entirely free from involvement. Drainage of the hepatic ducts when involved can be had by leaving the cystic duct open. Mayo does not think that Kehrer's percentage of cases in which the hepatic ducts require drainage is too high—namely, 37 %. A convenient method of draining the cystic duct, and through it the hepatic ducts, is that which Mayo previously described. It consists in removing the fundus of the gallbladder and the mucous membrane of the remaining portion. This gives all the advantage of temporary hepatic drainage with the permanent benefits of cholecystectomy. The other method, which consists in dividing the cystic duct and leaving it open, does not compare in ease and safety with the method recommended by Mayo. In stones in the common duct drainage of the hepatic duct is essential. Mayo has lately practised the plan of draining the common duct after the removal of stones, as was first suggested by W. E. B. Davis. In 49 choledochotomies Mayo had but 2 deaths. In the majority of these cases the duct and gallbladder were both drained. The 454 cases which formed the basis of this paper were operated upon by W. J. and C. H. Mayo. [A paper by the Mayos is sure to be filled with valuable precepts of practical surgery and is invariably founded on a very large collection of thoroughly studied and carefully tabulated cases.]

William J. Mayo¹ presents a study of 534 operations upon the gallbladder and bile-passages with a tabulated report of 547 operated cases.

An instructive dissertation on the diagnosis of gallstones is presented by Murphy.² The pain of gallstones is divided into 3 kinds: first, the acute inflammatory or infective type occurring in virulent infections and accompanied by involuntary muscular contraction of the organ; second, the aching, cumulative, tension type, which is not guarded by abdominal tension, but defended by sudden muscular contraction when pressure is made; and third, the referred ache or pain which accom-

¹ Boston M. and S. Jour., May 21, 1903.

² Med. News, May 2, 1903.

panies either of the preceding kinds. There is neither sensitiveness to percussion or pressure at the point to which the pain is referred. The spasmodic type of pain termed colic occurs only when a foreign body is being transmitted through a canal, the lumen of which is normally smaller than the diameter of the foreign body. It is never produced by either the overdistention of the gallbladder or the retention of bile and mucus under pressure. As soon as the foreign body becomes stationary the pain intermits. Murphy does not agree with Kehr that the colic is due to inflammation of the gallbladder. It is thought that the passage of the gallstone is due to the cumulative pressure behind and not to any peristaltic wave in the biliary ducts. The fact is emphasized that colic is absent in every type of biliary obstruction except that of foreign bodies, such as calculi, clumps of mucus, etc. The nausea and vomiting of biliary obstruction are reflex symptoms, and by their relaxing effect they favor the dropping back of the stone into the gallbladder in obstructions of its pelvis, and thus often terminate the attack. The vomiting may last from a few minutes to several hours or days. A second variety of reflex vomiting due to torsion, flexion, or valvular obstruction of the cystic duct is mentioned. In this class the vomiting continues for days with no severe pain and no colic, and is relieved by liberation of the obstruction and escape of the gallbladder contents. When the abdomen is opened for this condition, the gallbladder is usually enlarged and not compressible. The fact is emphasized that hypersensitiveness of the gallbladder is present in all varieties of infection and calculus obstruction, but not in the neoplastic, torsion, flexion, cicatricial, or valvular obstructions. The most characteristic and constant sign of gallbladder hypersensitiveness is the inability of the patient to take a full, deep inspiration, when the physician's fingers are hooked up deep beneath the right costal arch below the hepatic margin. The diaphragm forces the liver down until the sensitive gallbladder reaches the examining fingers, when the inspiration suddenly ceases as though it had been shut off. Attention is called to the peculiar angularity of the temperature and the duration of the complete intermissions, in both of which characteristics it varies from the curves with remissions found in other types of infection. Murphy is a strong believer in Courvoisier's law: "In 80 % of the cases of obstruction of the common duct due to stones, there is contraction of the gallbladder, while in 90 % of the cases of enlargement of the gallbladder the obstruction is due to causes other than stone." In 86 % of the cases operated upon by Murphy jaundice was absent as a symptom at the time of operation and in the history given. Continuous jaundice throughout the course of the disease indicates malignancy. Therefore, a large gallbladder with jaundice is indicative of malignant disease or cicatricial contraction, and contracted gallbladder indicates a cholelith, in the percentage already mentioned. Murphy formulates the following law: "(1) That jaundice due to gallstone is always preceded by colic; (2) that jaundice due to malignant disease, or catarrh of the ducts accompanied by infection, is never preceded by colic." When a large calculus produces disturbance by impaction in the cervix of the gallbladder, the

symptoms are pain, nausea and vomiting, pronounced hypersensitiveness, particularly when, in the examination, the fingers are hooked up under the liver and the patient attempts to take a deep inspiration; then the pain becomes intolerable. In this variety there is no jaundice and no elevation of temperature and the attack may subside with vomiting which causes the stone to drop into the gallbladder. The cessation of the pain after vomiting is considered very characteristic. When infection of the gallbladder is associated with calculus, the disturbance produced is in direct proportion to its virulence and tension. If mild it produces a hypersensitiveness and no pyrexia unless the products of infection are retained in the gallbladder under pressure by the impaction of a stone in its cervix. It is in this variety that necrosis of the gallbladder and rupture may take place. The symptomatic manifestations of infectious cholecystitis without impaction of the stone in the neck of the gallbladder or cystic duct are neither so severe nor dangerous as when the impaction occurs after a virulent infection. In this condition the temperature rises high, the vomiting is persistent, and the depression great. So destructive is infection under these circumstances that the mucosa of the gallbladder rapidly becomes gangrenous from the biotic and toxic effect of the microorganisms and the pressure under which the products of infection are retained. The next type of infection of the gallbladder which is described is that which is characterized by recurring chills, high temperature, and sweats, and which is most usually diagnosed malaria. There is an absence of pain, no colic, no jaundice, but occasionally a mild discoloration of the sclera. The condition is usually acute, and in Murphy's cases there has been enlargement and edema of the gallbladder wall. The diagnosis is difficult, but the chills and irregular temperature are characteristic. There is also one physical manifestation which was uniformly present in all of Murphy's cases of this type; it was the inability of the patient to take a deep inspiration without pain when the physician's fingers were deeply pressed beneath the right ninth costal cartilage. These attacks occur with or without stone; more frequently without. Acute phlegmon of the gallbladder may possibly be confused with this condition. There is another class of cases described, the contracted type of gallbladder with infection, with or without preceding colic, but usually the sequence of primary calculous disease. In this class the patient has recurrent attacks of chills and high temperature with subsidence, remaining normal from a period varying from a few hours to as many months, when the same symptom-cycle is again passed through. Here we have also the classic temperature angle of cholangic infections. The gallbladder is contracted to a test-like process, indurated, deformed, and surrounded by adhesions. The symptoms of stone in the common duct are in most instances quite characteristic. Its arrest in the duct is sometimes followed by a dilation of the duct on the hepatic side of the obstruction, which may become so great that the stone is permitted to slide back and forth, giving rise to the valve-like action of Fengel. Infection of the duct is very likely to take place, and the patient then develops the manifestations of an infective

jaundice with repeated chills and high fever characterized by intermissions. Once sepsis is manifested with a stone in the common duct, there appears to be no cessation of the septic process, until the foreign body is removed. "When the stone is arrested in the ampulla of Vater, the drainage is frequently more free and the manifestations of sepsis less marked, than when it is $\frac{1}{2}$ inch or more from that point in the common duct. When in the ampulla of Vater, we have the additional danger of infective pancreatitis or fat necrosis. When in the course of a calculous jaundice we have a sudden and extreme collapse, intense pain without any gradual preceding increase of pain, it is right to assume that the condition is due to a beginning fat necrosis, and not to a perforative peritonitis, nor to a progressive infective cholangitis. In the fat necrosis there is no hyperleukocytosis; with perforative peritonitis, and the acute infective cholangitis there is a pronounced hyperleukocytosis." Drainage of the gallbladder has a beneficial effect on the fat necrosis even when the pancreas is not incised. When gallstones produce intestinal obstruction, they have usually escaped from the gallbladder through a perforation of its wall or of its ducts. It is rarely preceded by jaundice, as stones of great size seldom find admission into the intestine through the common duct. There are no special symptoms by which the obstruction of biliary enteroliths can be differentiated from the obstruction of coproliths.

Brewer,¹ after presenting in detail the differential diagnosis of diseases of the gallbladder and ducts, considers the 3 chief symptoms occurring in diseases of the gallbladder and ducts, namely, pain, tumor, and jaundice. The occurrence of repeated attacks of acute paroxysmal pain, in the upper right quadrant of the abdomen, strongly suggests a lesion of the biliary passages. This suggestion is accentuated if the attacks occur at night, or during fasting, and are accompanied by vomiting and fever. If the pain radiates upward to the back and shoulder, and if an area of tenderness exists under the free border of the ribs, the diagnosis is still more probable. If in addition to the pain there is a palpable and tender tumor in the gallbladder region with moderate spasm of the rectus muscle, the case is probably one of cholecystitis. If tumor is absent and jaundice is present, there is probably a stone in the common duct. The development of a tumor preceded by a history of tumor which is round, smooth, and elastic, and which lies immediately under the abdominal wall below the ribs, moves with respiration, allows a certain amount of movement, which cannot be made to disappear like a movable kidney, and which is not accompanied by pain and fever, is in all probability a gallbladder distended with mucus. If with such a condition there is progressive jaundice, there is probably a non-calculus common-duct obstruction. If such a tumor is sensitive to the touch, and accompanied by fever, pus is probably present. A tumor corresponding to the above description, without pain, fever, or jaundice at first, but presenting a hard, irregular surface, is in all probability cancer. The occurrence of a mild transitory jaundice unaccompanied

¹ Boston M. and S. Jour., May 14, 1903.

by other symptoms suggests a catarrhal obstruction of the common duct. Temporary jaundice with colic suggests the passage of a stone through the common duct into the intestine. The occurrence of intermittent jaundice, intermittent colic, and intermittent fever suggests a floating stone in the common duct. The occurrence of continued jaundice, with chills, fever, hepatic enlargement and tenderness, hypertrophy of the spleen, and general sepsis, suggests an infective cholangitis. The occurrence of a progressively increasing jaundice and enlargement of the liver, with a previous history of colic, but without distention of the gallbladder, suggests an impacted stone near the papilla. The occurrence of a progressively increasing jaundice, without pain or fever, but with a tumor of the gallbladder, suggests common-duct obstruction from new-growth.

Attention is also called to the facts that gallstones are rarely found in young people, that they are most frequent in females, and that 90 % of these have borne children. In common-duct stone the calculus is found in 67 % of the cases in the duodenal extremity; in 15 % in the hepatic extremity; and in 18 % in the middle portion of the duct. One-half of all cases of common duct obstruction only are due to stone. In 70 % of the cases of obstruction located in the neck of the gallbladder the pain is referred to the right subscapular region, in 10 % to the left subscapular region, and in 20 % to the precordia, sternum, right subclavicular region, or neck. Jaundice is absent in from 80 % to 90 % of operative cases of gallstone or duct disease. Jaundice preceded by colic is practically always due to stone. Jaundice without pain is practically always due to inflammation or new-growths of the ducts or to outside pressure. Murphy is quoted as saying that during the presence of a calculous jaundice, the sudden occurrence of acute epigastric pain, muscular rigidity, nausea, vomiting and collapse, without leukocytosis, strongly suggests acute pancreatitis occasioned by the presence of a stone in the diverticulum of Vater.

Ehret¹ discusses the **diagnosis of the location of gallstones**. It is stated that when the stools continuously present a more or less bile-stained character, and when in the intervals between attacks there is little or no jaundice, the location of the gallstones may in most instances be diagnosticated by a careful consideration of 4 symptoms—namely, fever, jaundice, pain, and the condition of the blood. When fever is associated with gallstones, it indicates infection. The infection follows interference with the onward flow of bile. Microorganisms are always present in the biliary tracts, but become much more abundant as the duodenum is approached; therefore a gallstone is more liable to give rise to infection the further down the ducts it is situated. The fever, when the infection takes place in the duct, is apt to be a high one and of short duration, but when the stone and infection are in the gallbladder, fever does not go so high, but is more prolonged. This comparison, of course, is made with stones in the common duct which do not produce absolute obstruction. The downward flow of bile tends to overcome the infection,

¹ La Sem. Méd., Jan. 7, 1903

and the result is a cessation in the fever and other evidence of infection. There is no such influence in the gallbladder or cystic duct to aid in overcoming the infection, and therefore it is apt to be of longer duration. According to this rule, in those cases accompanied by frequent attacks of a rapidly rising, high temperature (the type of intermittent hepatic fever described by Charcot), the seat of stone is likely to be in the common duct. Jaundice is said usually to depend upon an angiocholitis involving the smaller ducts, and not upon mechanical obstruction by one or more gallstones. Generally attacks of jaundice which occur frequently and are of short duration are the result of stone or stones situated in the bile-duct. Jaundice, when the stone is confined to the gallbladder, is rare. Naunyn has shown that when the stone is in the gallbladder pain is intense, but that when it is in the bile-duct pain is slight. It is therefore stated that febrile attacks with intermittent jaundice unassociated with severe pain suggest that the stone is in the common duct. A continuous leukocytosis is of value as a symptom, and it tends to indicate that the stone is situated in the gallbladder. A leukocytosis which occurs during the attacks and disappears during the interval is of no diagnostic value.

Delageniere¹ describes a successful case of incision of the hepatic duct for the extraction of calculi. The operation is called **hepaticotomy**. It is stated that only 6 other cases of this operation have been recorded. The calculi were impacted near the hilum of the liver at some distance from the common duct. The method of exposing the gallbladder and its ducts is carefully described. After exposing the hepatic duct in the case reported and removing 2 stones, the incision in the duct was closed by a continuous suture. Suture of the bile-ducts is strongly recommended, though the author admits that it is seldom perfect and must be associated with drainage.

Rutherford Morrison² describes an incision for operations upon the gall-passages which is **transverse**, beginning 1 inch below the tip of the twelfth rib ending in the middle line at the upper part of the middle one-third of a line drawn from the ensiform cartilage to the umbilicus. All the layers of the abdominal wall including the rectus are divided. It is maintained that this incision gives a much better exposure than the vertical one through the rectus muscles, and that if properly approximated there is less likelihood of hernia. The wound should be closed in layer sutures. Forty-three gallstone patients have been traced since operation, and in 41 of these the transverse incision was employed. Seven of the 43 patients had some complaint to make: in 1 it was known that a stone had been left at the time of operation; in 2 cases the trouble was probably due to a recurrence of stones, as there was no relapse until 4 and 6 years after operation; in 1 case it is not certain that stones were the cause of the illness, as none were found at a second operation; of the remaining 3 cases it is certain in 1, and highly probable in 2, that stones had been overlooked at the time of operation. A careful inquiry was made regarding an occurrence of hernia in these cases and it was dis-

¹ Bull. et Mem. de la Soc. de Chir. de Paris, No. 10, 1903.

² Brit. Med. Jour., Nov. 8, 1902.

covered in 4 of the 43 patients. In one of the cases it occurred where a vertical incision had been employed. In the other 3 it was attributed to defective suture.

Thienhaus¹ urges **the transduodenal route (duodenal choledochotomy) in cases of impaction of gallstones in the lower portion of the common duct.** He reports a case in which he removed 3 stones from the common duct by incising the duodenum, and in which he believes it would have been impossible to have removed them by opening the common duct alone.

Regarding Mayo Robson's statement, as to the mortality of this operation, the author has collected 29 cases with 2 deaths, or about 7 %, and a little less than that which has accompanied the operation of choledochotomy in Robson's hands. As to the greater chances of sepsis in the duodenal route, Thienhaus quotes Riedel, who has pointed out that those cases in which severe infection of the bile-passages has taken place before operation are the ones giving a high mortality from sepsis after operation. These people die whether one resorts to transduodenal choledochotomy, to supraduodenal choledochotomy,¹ or to any other method. The author also points out that it is often impossible to remove a stone impacted in the retroduodenal portion of the common duct, near the opening of the papilla, before the diverticulum of Vater, or before the pancreatic portion of the common duct, by supraduodenal choledochotomy. It has been pointed out that it would be difficult to clean out from the duodenum all the stones in the common duct when lying in the supraduodenal portion or in the hepatic duct, and that when a stone is impacted in the retroduodenal portion of the common duct, and more or less complete obstruction has taken place for some time, the common duct usually becomes dilated; and if there are other stones lying higher up, they are generally movable, and can, after removal of the impacted stone, be easily stripped down into the duodenum by putting two fingers of the left hand into the foramen of Winslow, and the thumb above the duct. In his own case he found it easy to remove 3 stones lying behind the incarcerated concretion because he had already, before incising the duodenum, stripped them down to the impacted stone, and held them tightly in this position to avoid their slipping back after the opening and collapse of the duct. From the study of this question Thienhaus draws the following conclusions: "First, the transduodenal route has a well-defined place in the surgery of obstruction of the common duct produced by gallstones; second, transduodenal lithotomy, first advocated and practised by McBurney in 1891, either after his methods, that is, with incision of the papilla, or Collins's method, that is, dilation of the papilla, is the method *par excellence* for all cases of gallstones impacted at or near the opening of the papilla, as soon as experiments of manipulation, to press the stone into the duodenum by bimanual manipulations, have proved unsuccessful; third, transduodenal choledochotomy is indicated for stones impacted in the retroduodenal portion of the common duct, or before the diverticulum of Vater, as soon as efforts to dislodge

¹ Ann. of Surg., Dec., 1902.

the stone up into the supraduodenal portion have proved futile; fourth, in all cases in which transduodenal choledochotomy has been performed, it is advisable to suture the common duct to the duodenum to avoid infection (choledochoduodenostomia interna); fifth, transduodenal choledochotomy seems to be more advisable than retroduodenal choledochotomy because it can be more easily performed, and the integrity of the pancreas is not interfered with; sixth, it has not been proved by statistics that transduodenal choledochotomy has a greater percentage of fatalities produced by septic infection than supraduodenal choledochotomy. Further contributions in this direction are desirable for the purpose of procuring definite conclusions. Most of the cases where sepsis was the cause of the death of the patient after an operation on the common duct were cases of infection of the bile-passages before operation, and the method of operation was not responsible for the fatal result."

B. B. Davis¹ discusses the **indications for cholecystectomy**. The author first calls attention to the unsatisfactory results frequently obtained after the performance of cholecystectomy, and later particularly refers to Hans Kehr's statistics to show that the relief following cholecystostomy is often disappointing. In 17 % of the cases Kehr says that relief is only partial, whereas less than 1 % of the same operator's cholecystectomies continue to present symptoms after these operations. Davis states that since January 1, 1902, he has done 12 uncomplicated cholecystotomies with no deaths; 16 complicated cholecystotomies with 3 deaths; 12 cholecystectomies with 1 death, and in these cases conditions were badly complicated. After cholecystotomy there are a number of conditions which may seriously interfere with perfect drainage of the gallbladder. They are: "(1) Adhesions to neighboring viscera; (2) crippling of the gallbladder from inelasticity of its walls; (3) partial occlusion of the cystic duct; (4) interference with the perfect contraction of the walls during the effort to empty itself, due to the fundus being fixed to the anterior abdominal wall; (5) the weight of the liver pressing down on the anchored gallbladder." Of course there are a number of conditions demanding opening of the gallbladder in which the cystic duct is normal and in which the mucous membrane is intact and the walls normally elastic. Such cases usually do well after simple drainage, but when complications exist, such as those above enumerated, the convalescence is apt to be prolonged and imperfect. The advantages of cholecystectomy are enumerated: "(1) When the cystic duct is wholly or partially occluded healing is prompt and complete; (2) when the wall of the gallbladder is thickened, friable, and atrophied, the functionless viscus is taken out and can no longer torment the patient; (3) when there are adhesions they will remain as long as a pathologic gallbladder is present to keep up the irritation; (4) it is a well-known fact that intraabdominal adhesions gradually weaken, stretch, and disappear when there is no disturbing element; (5) the value of the gallbladder as a reservoir for the bile is *nil*, and functionally it serves no more useful purpose than does the vermiform appendix; (6) after a gallbladder has been as profoundly

¹ Jour. Am. Med. Assoc., June 20, 1903.

diseased as it usually is when made the object of surgical attack it never regains its normal state and is thenceforth not only valueless but, on account of the defective drainage, is constantly subjected to the risks of fresh infection; (7) the cholesterin, which is the principal element of almost all stones,¹ is only elaborated in such a quantity as to do harm by the epithelium of the gallbladder when infected, being due to degeneration; therefore, when removed, all danger of future stone formation is at an end; (8) it is estimated that at least 5 % (Mayo) of the cases of serious disease of the gallbladder are followed eventually by carcinoma; removal will take away this menace." In gangrene and empyema of the gallbladder cholecystectomy is also recommended, but it is admitted that there are conditions of this kind when the simplest and quickest surgical procedure possible to give temporary relief is all that is indicated. Where drainage is required after cholecystectomy in the presence of infection, Davis recommends the method of Mayo, and removes a portion of the outer coats of the gallbladder near the cystic duct, and attaches to them a drainage-tube by means of the purse-string suture.

H. M. Richardson¹ reaches the following conclusions after dealing with the **indications for extirpation of the gallbladder**: "(1) Certain lesions in themselves demand removal of the gallbladder whenever possible. Such are new-growths and gangrenes. (2) Certain other lesions of the gallbladder are better treated by cholecystectomy. These are the contracted and inflamed gallbladders, with thickened walls. All gallbladders which do not permit easy and efficient drainage should be extirpated, for in such gallbladders the risks of drainage are quite as great as the risks of extirpation; and the one great advantage of retention is impossible—retention of the biliary reservoir to fulfil the functions of that reservoir, and to permit, if necessary, renewed drainage in future years. (3) Drainage is preferable in the dilated and infected gallbladder, which, however, is neither gangrenous nor to any great extent changed—the slightly thickened gallbladder containing gallstones and infected bile. This gallbladder will, after drainage, become normal, and therefore capable of fulfilling the functions of a gallbladder. Through it the biliary passages will become effectually drained, after subsidence of the temporary swelling about the cystic duct. (4) As a rule, drainage rather than extirpation is demanded in acute cholecystitis with severe constitutional symptoms, when the gallbladder is dilated, or at least not contracted, and when it is not gangrenous. (5) In chronic cholecystitis, with dilation and thickening of the gallbladder, especially when a stone is impacted in the cystic duct, extirpation is the preferable operation, unless the stone can be dislodged backward into the gallbladder, in which case drainage is, if not preferable, quite as advantageous as extirpation. (6) In simple gallstones, without visible evidence of infection or chronic changes incompatible with complete restoration of function, simple drainage of the gallbladder is indicated. (7) In chronic pancreatitis, whether associated with gallstones or not, drainage through the gallbladder is indicated. Cholecystectomy is unjustifiable, for immediate drainage is

¹ Med. News, May 2, 1903.

essential. Furthermore, reopening of the biliary passages may in the future be required."

J. F. W. Ross¹ calls attention to the **great improvement in the treatment of gallstones by surgical measures**, and refers to the dangers incurred by patients suffering from gallstones. These dangers are considered sufficient warrant for surgical procedure in practically all cases. Two cases of gangrene of the gallbladder are referred to in which recovery occurred after simple drainage. Cholecystectomy is discussed at some length. This operation should be performed in gangrene unless the local conditions present a contrary indication. In the presence of obstructive jaundice cholecystectomy is not advisable. In such cases drainage should be established. Because stones have been found in the hepatic duct when the cystic duct was obstructed, Ross does not think that the operation of cholecystectomy can be looked upon as a warrant of future immunity from gallstones. In performing cholecystenterostomy he prefers a small Murphy button, although he has also used the elastic ligature. The colon is chosen as the most suitable portion of the intestine for anastomosis with the gallbladder. The operation of cholecystenterostomy, however, must be looked upon as a makeshift, to be used only when the patient is in bad condition, since stones in the common duct can, in most cases, be removed by incising the duct. The use of the sandbag underneath the back is a great aid to the exposure of the common duct. Ross is a strong advocate of posterior as well as anterior drainage in certain cases in which leakage is apt to occur after operation upon the gall-passages. He does not believe in opening the intestine for removal of a stone from the common bile-duct.

Six cases of **cholecystectomy** are recorded by Moynihan.² The author does not think that the removal of the gallbladder is necessary in cases of recent acute or subacute cholecystitis due to the blocking of the cystic duct by a large stone. The gallbladder should never be removed unless the operator is convinced that the common duct is open. It is Moynihan's habit to ligate the cystic duct in most instances when removing the gallbladder. The first case in which the gallbladder was removed was one of fistula between the gallbladder and duodenum. The patient recovered. The organ was removed in this case, as the operator was not sure that the thick pulpy wall of the gallbladder might not be the seat of new-growth. The second case was that of a woman 60 years of age suffering from primary carcinoma of the gallbladder. The cavity of the gallbladder was barely as large as a thimble and contained a dirty greenish-black fluid. No stone was present in either the gallbladder or cystic duct, and none could be felt in either the hepatic or common duct. Six months after the operation the patient had gained two stone in weight and was in robust health. The growth was a typical glandular carcinoma. The third case was one of membranous cholecystitis which was at first thought to be a growth of the ascending colon. When the abdomen was opened, however, the gallbladder was found adherent to the abdominal wall and ascending colon. This patient also

¹ Jour. Am. Med. Assoc., Dec. 20, 1902.

² Brit. Med. Jour., Jan. 24, 1903.

recovered. In the fourth case, one of chronic cholecystitis, the gallbladder and a portion of the liver were removed. The gallbladder contained about an ounce of pure pus and a number of stones. There was so much thickening about the gallbladder that it was thought it might be due to a malignant disease, and it was with this idea in mind that a portion of the liver was removed with the gallbladder. This patient also recovered. The fifth case was one of chronic sclerosing cholecystitis with multiple perforations and stone in the common duct. The stones had ulcerated through the walls of the gallbladder and lay in pockets in the omentum, and one was almost hidden in a cavity in the liver. A stone was removed from the common duct. This patient recovered. In the sixth case the gallbladder was removed because of incipient gangrene. This patient likewise recovered.

W. P. Manton,¹ of Detroit, describes a case of **extirpation of the gallbladder through a lumbar incision**. The diagnosis in this case was nephroptosis with probable cystic metamorphosis of the kidney. When the kidney was brought out of the lumbar wound, the gallbladder, containing a number of stones, could be easily palpated, and was so thoroughly shut off from the general peritoneal cavity either by adhesions or because of its anomalous situation that the operator was able without much difficulty to remove it and also the cystic duct. The cystic duct and gallbladder contained 19 stones, the size of hazel-nuts. The operation was peritoneal.

W. W. Seymour² discusses the **present position of gallstone surgery**. He states plainly in the beginning that no gallstone can be dissolved, and that therefore operation is indicated early, not necessarily after one attack, but certainly after repeated attacks of gallstone colic. He refers to a case in which the physician assured the patient that he was cured of gallstones by medicines and yet the patient died within 6 weeks of the time of the assertion, from perforation of a gallbladder which contained 150 stones. The patient had been considered cured, when the stones were only quiescent. Gallstone colic is due rather to the inflammation caused by the stone than to the presence of the stone itself. A distended gallbladder accompanied with jaundice indicates malignancy. Reference is made to the great frequency of the removal of the gallbladder for the cure of gallstones, and also to the recent improvement in the treatment of stones in the common duct, and the great advantage to be obtained by drainage of the common and hepatic ducts. Seymour bases his remarks upon a series of 47 operations on the gallbladder.

Fistula between the gallbladder and stomach is discussed by Snively,³ who reviews the literature on the subject and reports an interesting case. The rarity of the condition is shown by the fact that, out of a collection of 10,866 autopsies, fistula between the gallbladder and stomach was found but once. Other biliary fistulas occurred 42 times. The case reported is that of a woman, 53 years of age, who

¹ Amer. Med., Oct. 4, 1902.

² Jour. Am. Med. Assoc., April 18, 1903.

³ Jour. Am. Med. Assoc., April 11, 1903.

suffered from numerous attacks of hepatic colic, during which she passed large numbers of stones. Symptoms of gallstones had existed for 22 years. In a recent attack the patient passed 97 stones, and in one previous to that 80 stones. After the last attack she improved in strength, but the bowels remained constipated, and she complained of a burning sensation in the stomach. The diagnosis of fistulous opening between the gallbladder and stomach was made upon the following symptoms, which later developed: Eructations of bile and gas; a persistent tender spot in the region of the pyloric end of the stomach; continuous obstinate constipation, and pain when any food was taken into the stomach. At this time operation was advised, but the patient refused to be operated upon; later, however, she consented, and Cullen, of Baltimore, operated. The gallbladder was small and found intimately adherent to the stomach and surrounding structures. The opening between the stomach and gallbladder was easily discovered and the two organs were separated. The opening in the stomach was closed, the gallbladder was attached to the abdominal wall, and 2 stones were removed from the cystic duct. On the fourth day after the operation the stools were bile-stained. The external fistula closed promptly and the patient ultimately recovered.

Sixteen cases of **primary cancer of the hepatic duct** have been collected from the literature by Ingelrans.¹ The disease appears to be about as common among women as among men. The ages of the patients vary from 29 to 73 years. Secondary involvement of other organs, excepting the liver, is rare. Jaundice precedes cachexia. If one branch of the duct is free, jaundice is not an early manifestation. There is marked dilation proximal to the growth. This is sometimes so great as to produce an angiomatous appearance of the liver. The liver is usually much enlarged and smooth, but it may even be atrophied. The invariable symptom is jaundice, which is persistent until death, which takes place in from 2 to 26 months. The patients complain of itching of the skin, and especial disgust for fatty foods. The pain varies in degree, but tenderness is almost invariable. The leukocytosis varies. In Ingelrans's case it was 30,080, but in Jenner's case it was but 9000.

Before entering upon a discussion of **malignant disease of the gallbladder**, William J. Mayo² states that between 1891 and 1902 he and Charles H. Mayo in 405 operations upon the gallbladder and biliary passages encountered malignant disease 20 times, or in about 5 % of the cases. A careful study of the statistics shows the following facts to be indisputable: "First, gallstones are almost constantly present in primary malignant disease of the gallbladder and rarely in secondary; second, the relative proportion of gallstones and malignant disease of the gallbladder in women and men is practically identical; third; the pathologic lesions found are best explainable on this theory; and, fourth, the similarity in age frequency. Certainly we are warranted in concluding that gallstones are the most important etiologic factor in malignant disease of the gallbladder." The diagnosis of primary cancer of the gallbladder may be easy, since there is usually a hard tumor in the region of the gallblad-

¹ Arch. Gén. de Méd., Sept., 1902.

² Med. News, Dec. 13, 1902.

der not very tender to touch, and, unless there is some peritonitis in the neighborhood, there is little abdominal rigidity. Progressive loss of weight takes place and the tumor becomes nodular. Later jaundice develops. Usually a previous history of gallstone-disease can be obtained. Jaundice when it occurs is persistent and unchanging, and if a tumor is present which is accompanied by loss of flesh and which appeared before the jaundice, there can be but little doubt as to the malignant nature of the trouble. It sometimes happens that even on the operating table it is impossible to say whether a thick-walled gallbladder is malignant or not. Many surgeons have reported errors of judgment in such cases, and Mayo reports one of his own. Since cholecystectomy is gradually replacing drainage in these cases, it is thought that many cases of cancer of the gallbladder will be discovered early and removed. Mayo reports a second case of cancer of the gallbladder in a woman 63 years of age in whom the growth returned one year after a cholecystectomy. Another case is referred to in which he removed a portion of the liver with the gallbladder. In this case there was also a recurrence. In all the cases in which the liver is involved or in which the lymphatics are involved, recurrence takes place early.

Gibbon,¹ after calling attention to the extreme rarity of **gangrenous cholecystitis**, reports a case in which he successfully removed the gallbladder. The patient was a woman 52 years of age who gave a history of frequent attacks of indigestion accompanied by nausea and vomiting. The present attack began in the same way and had lasted for 3 days when she was admitted to the hospital. She presented evidences of a peritonitis, abdominal pain being particularly marked on the right side. The rigidity was sufficient to prevent palpation of the distended gallbladder, and it was not until the patient was anesthetized that the condition was absolutely differentiated from appendicitis. The patient's leukocyte count was 37,600. Free fluid was found in the abdominal cavity and the gallbladder was covered by adherent omentum. There was a quantity of lymph about the liver, omentum, and bowel in the neighborhood. The general cavity was protected by gauze pads, and the gallbladder, which was distended and very dark in color, was opened, a quantity of very foul pus being evacuated. The fundus of the gallbladder was gangrenous through all its coats. The line of demarcation between this and the remaining portion of the organ was very clear and could be observed months afterward in the specimen. A large stone was found fixed at the mouth of the cystic duct. The general condition of the gallbladder walls can be understood from the fact that when a ligature was placed about the cystic duct, the gallbladder separated and came away before the ligature was tied. Extensive gauze drainage was employed and the patient made a complete recovery. It is stated that gangrenous cholecystitis rests probably on two causal factors, obstruction of the cystic duct and infectious microorganisms. It is very doubtful whether either of these conditions alone could produce gangrene of the gallbladder or even phlegmonous cholecystitis. A true gangrene,

¹ Am. Jour. Med. Sci., April, 1903.

such as is presented in this case, does not of course develop until inflammation has become sufficient to shut off the circulation. The abundant blood-supply of the gallbladder no doubt saves it frequently from gangrene, just as the poor blood-supply of the appendix renders it more liable to this condition. Although the gallbladder separated when very little traction was made upon it in this case, the cystic artery bled freely, and because of the infiltration about it afterward, it was found impossible to control the vessel with forceps, and therefore gauze packing was resorted to for this purpose. The adhesion of the omentum over the whole fundus of the gallbladder was quite similar to the same condition so frequently found in the appendix. The symptoms in such a condition as this are those of a violent localized peritonitis, with usually some elevation of temperature, persistent vomiting, obstruction of the bowels, and a high leukocyte count. Jaundice is not generally present unless there exists marked cholangitis or unless the inflammation has extended by contiguity into the liver structure. The condition is likely to be confused with appendicitis, but when the patient is anesthetized the two conditions can usually be differentiated, and both of course call for operation. The author believes that the only treatment for a condition so dangerous and severe as gangrene of the gallbladder is immediate removal. This view is shared by most American surgeons, although there are men of large experience who think that drainage alone should be the operation of choice. It is thought that the same rule should apply to gangrene of the gallbladder as applies to gangrene of the appendix. The immediate relief in the author's case, as indicated by the subsidence of symptoms and the drop in the leukocyte count from 37,600 to 12,600 in 24 hours, is attributed to the complete removal of the offending organ.

A case of primary typhoid perforation of the gallbladder is reported by Erdmann.¹ The patient was a woman 46 years old. The perforation occurred in the sixth week of the fever and during the first week of convalescence. During the third and fourth week a left-sided phlebitis developed. The patient suffered from two attacks of pain in the back between the shoulder-blades during the third week, but there was no other symptom to suggest trouble either of the gallbladder or the liver. At the time the perforation took place the patient's temperature had been normal for a week. Erdmann saw the patient 12 hours after the onset of pain. At this time she presented the following symptoms: anxious countenance; pulse 120; respiration rapid; temperature 102°; abdomen somewhat distended; exquisitely sensitive, but more marked on the right side. It was thought that the patient probably had an intestinal perforation; therefore, the right iliac fossa was first explored. When the peritoneum was opened there was a gush of bile-stained colored fluid with no odor and containing no fecal matter. No perforation was found in the small intestine, and a further exploration revealed a perforation of gallbladder about $\frac{1}{4}$ of an inch in diameter and situated in the lower portion and near the cystic duct, and through it clear bile was flowing. There was no evidence externally whatever to indicate any

¹ Ann. of Surg., June, 1903.

inflammation of the gallbladder. An immediate cholecystectomy was decided upon, and easily accomplished. Drainage was established at former site of gallbladder and another drain placed in the pelvis. The patient recovered. When the gallbladder was opened two small stones were removed, but they were so small as not to be considered factors in the production of the ulceration. The mucous membrane showed numerous small points of ulceration; one about the size of the head of an ordinary pin was found to connect with the opening on the peritoneal coat by an oblique channel. Cultures taken from the fluid found in the peritoneal cavity showed the colon and typhoidal bacilli. Erdmann discusses typhoidal perforation of the gallbladder based upon 34 cases which have been collected from the literature. The diagnosis of the condition can only be approximately made by obtaining a very thorough and careful anamnesis, particular stress being laid upon the original site of the pain. The only treatment is operative. Erdmann strongly urges the removal of the gallbladder. When this is impossible, the gallbladder should be opened and drained; inversion of the perforation by sutures is unwarranted. Of the 34 cases reported, 4 patients recovered and 30 died. Of these, 7 were operated upon and 4 recovered, while of the nonoperated patients, 27 in number, all died.

A. E. Ash¹ describes a **typhoid perforation of the gallbladder** occurring in an English soldier 27 years old. On the twenty-ninth day of the disease cholecystitis was diagnosed and an exploring needle introduced at the lower margin of the liver dulness. No fluid was found, however. The patient grew worse, and died on the thirty-third day of the disease. At the autopsy the gallbladder was found perforated, and when examined it showed three points of ulceration, one of which had perforated. It was discovered that the exploring needle had entered only the liver-substance. [One lesson which this case would seem to teach is that the exploring needle is hardly a reliable diagnostic measure in cases of supposed cholecystitis.]

W. W. Grant² reports a case of **rupture of the gallbladder**, believed by him to be the result of violent vomiting. In this case the appendix was cystic and was also found ruptured. The patient died of septic peritonitis. No gallstones were found at the operation, but it was believed that the gallbladder and ducts were the seat of advanced inflammation. In making a diagnosis it was difficult to decide whether the case was one of perforated gallbladder or a perforated appendix. No symptoms of an inflammatory or ulcerative condition preceded the illness.

Roswell Park³ presents a careful consideration of **cysts and other neoplasms of the pancreas**. His introductory remarks have to do with the anatomic relations of the pancreas. Cysts are considered under the classification adopted by Robson and Moynihan, that is, retention, proliferation, hemorrhagic, hydatid, congenital, and pseudocysts. The causes of retention cysts are: intrinsic—impaction of calculi and stricture; extrinsic—pressure from without, abnormalities of shape and position,

¹ Brit. Med. Jour., Aug. 30, 1902. ² Jour. Am. Med. Assoc., April 18, 1903.

³ Am. Med., June 13, 1903.

and closure or obstruction by parasites. Chronic pancreatitis may be looked upon as the commonest cause of retention cysts, producing, by inflammatory exudate, occlusion of the duct. In experiments upon animals it has been shown, however, that simple occlusion of the duct is insufficient to alone produce retention cysts. Proliferation cysts often so closely resemble malignant cysts that only their subsequent course indicates to which variety they belong. Some of them seem to be independent of the excretory ducts. They are more apt to be found at the tail of the organ and frequently contain blood-stained fluid. It is thought by some that they are really hemorrhagic in origin and they have received the name "apoplectic cysts." Park prefers the name cystic carcinoma to cystic epithelioma as applied to malignant cysts. These are essentially cystic formations with cancerous deposits in their walls, and are usually accompanied by secondary growths in the liver and adjoining tissues. Most of the hemorrhagic cysts met with are retention cysts into which blood has escaped in varying quantities. Hydatid cysts of the pancreas are extremely rare. Tricomi states that there are 7 cases on record. Congenital cystic degeneration resembles that of other solid viscera, and Moynihan states that there are but 3 recorded instances. Pseudocysts, as Körte has proposed to call them, constitute a large proportion of cases reported as pancreatic cysts. These are fluid collections in the lesser omental cavity, and it is often impossible to differentiate them from true pancreatic cysts. They often contain pancreatic elements and are sometimes spoken of as peripancreatic cysts. They result, as a rule, from an injury of the organ, allowing the escape of blood and pancreatic juice. Such swellings present themselves usually in the umbilical, epigastric, or left hypochondriac regions. The fluid is peculiar in that there is an absence of trypsin. It is thought that injury has more to do with the production of pseudocysts and morbid processes than with the true pancreatic cyst. It appears that the greater proportion of the former are encountered in males, who are more exposed to injury; whereas of the latter the majority seem to occur in females. The youngest patient with pancreatic cyst reported was a child 13 months old. Cysts may be single or multiple and the fluid may be almost any color, but it is usually brown, tinted according to the amount of blood admixture. It is alkaline in reaction and of low specific gravity. It always contains albumin, usually cholesterin, and sometimes epithelial or fatty debris. It may contain either of the pancreatic ferments, proteolytic, fat-splitting, or starch-converting. The latter seems unimportant; the two former are of interest, or even importance. Their presence is of real import, their absence of negative value. When enzymes are present in considerable and active amounts, the presumption is strong that this fluid comes from the pancreas. The cyst may reach such size as to even resemble an ovarian cyst. The growth of the cyst is most commonly beneath the stomach and above the colon, pushing forward the gastrocolic omentum. This is the variety best suited for operation. The next most common direction is above the stomach, between this and the liver, where adhesions make enucleation difficult or impossible. These cysts are

usually adherent, sometimes firmly or densely adherent, to the adjoining structures. When a cyst is thus fixed, it will be best not to attempt to enucleate, but rather drain front and rear. The portal vein has often been found deeply buried in the cyst-wall; however, adhesions are not always met and enucleation is sometimes easy. The symptoms are mainly those caused by pressure. Vomiting is usually proportionate to the pain. Emaciation is rapid. Fat in the stools and glycosuria are most suggestive, though less frequent in cystic than in other pancreatic diseases. The salol test may be of service; it is based on the fact that the presence of the pancreatic secretion in the intestine causes decomposition of salol in the duodenum into carbolic and salicylic acid, which may be recognized in the urine. The splenic vessels have been found both in front of and behind the tumor, and the superior mesenteric vessels have been found to cross the tumor surface. Aortic pulsation is often transmitted. A cyst may suddenly shrink and then gradually refill; or it may become suddenly enlarged by hemorrhage into it. Sudden collapse and pain indicate hemorrhage into the cyst. The use of the needle for diagnostic purposes is of little value and is strongly condemned on account of its dangers. The treatment is divided into aspiration, drainage, and removal. Aspiration is condemned. If drainage is done, the cyst should be securely sutured to the abdominal wall before it is opened, but it is not necessary to wait until adhesions have formed. If the suturing has been properly done, immediate drainage can be instituted. Posterior drainage through the left costospinal angle is of the greatest advantage, but should only be done after the most careful cleansing and scrubbing of the back. Anomalous conditions are frequently found which require especial and ingenious treatment; a number of such cases are referred to. After operation on pancreatic cysts recovery may be prompt and satisfactory and the pancreatic function be apparently undisturbed. Pancreatic fistula may persist for a long time without detriment and may be expected to close with or without treatment after a somewhat indefinite time. Of the solid tumors of the pancreas, cancer is the most frequent, and is far more common in the head of the organ, which, like the biliary passages, is most open to infection, more than half of the cases appearing here. It may begin in the glandular epithelium or in the cells of the excretory ducts. Terrier has extirpated one as large as the patient's head, which weighed $5\frac{1}{2}$ pounds. The symptoms of cancer are divided into those pertaining to the pancreas itself and its functions; those pertaining to adjoining and related organs; those indicating dissemination of cancer; and the tumor itself. The early symptoms are vague and indicate some form of digestive disturbance. Voluminous fatty stools, due to incomplete digestion, are occasionally noted. Should these symptoms be followed by jaundice and then by glycosuria with epigastric pain and emaciation, pancreatic cancer is probable. Pain is a very uncertain feature. When characteristic, it radiates around the sides to the back and may be severe. It may simulate the crises of tabes, but it lasts longer and is often worse at night. Jaundice usually appears late, though it may appear early. It is first a pressure-symptom and

later may be due to the extension of the disease to the liver itself. Ascites may result from pressure on the portal vein or involvement of the peritoneum. Intestinal obstruction may also occur. Bronzing of the skin may result from secondary involvement of the adrenals. Late in the disease a tumor may be felt which resembles a growth of the pylorus, but is deeper and more fixed and conveys a transmitted pulsation from the aorta. After the development of pain, jaundice, and tumor, the disease runs a rapid and fatal course. The outlook of such a condition is poor. Cholecystenterostomy is thought to be a better operation for the relief of symptoms than cholecystostomy. Tuberculosis of the pancreas is exceedingly rare. Syphilis may occur in the pancreas, but it has never been diagnosed during life. Pancreatic lithiasis is difficult of diagnosis. Kinnicutt has been able to collect but 7 cases, including one of his own, in which a diagnosis was made. In the absence of pancreatic calculi in the stools, there are absolutely no diagnostic symptoms. The discovery of pancreatic calculi in the stools being so rare, it will be seen that the evidences of pancreatic lithiasis are always very scanty; nevertheless attacks of colic in the upper abdomen, with or without jaundice, with undigested muscle-fibers in the stools, with evidences of diminished fat-splitting, and with glycosuria, may properly lead to a tentative diagnosis of this condition, which may be confirmed if fragile concretions destitute of biliary pigment and cholesterin are found in the evacuations.

Moynihan¹ reports a very interesting case of **pancreatic calculus** in a woman aged 57, of nervous temperament. After a number of months the patient lost considerable weight and had persistent attacks of epigastric pain which closely resembled hepatic colic, though less severe, and unattended, until very late in the history, by jaundice, which was then but trivial. A peculiar irregular pigmentation of the skin of the color of *café au lait* had developed slowly. The stools were occasionally "frothy" and "greasy." An examination under chloroform revealed an indefinite swelling above the umbilicus extending a little to both sides of the median line. Moynihan made a diagnosis of chronic pancreatitis, probably due to a stone in the pancreatic duct. A month later the abdomen was opened. The gallbladder was found distended, but neither it nor any of the ducts were adherent. The pancreas was enlarged, particularly at the head. At the point of entrance into the bowel a small hard tumor could be felt. The duodenum was incised and a stone removed from the lower end of the pancreatic duct. The opening into the duodenum was closed and the gallbladder drained. The patient made a very satisfactory recovery. The pigmentation of the skin, which was a most marked symptom before the operation, had undergone a considerable fading at the end of a month after operation. The stone was about the size of a French bean, $1\frac{1}{2}$ inches in length, and about $\frac{3}{8}$ of an inch in diameter. Moynihan before describing this case deals with the history, symptoms, diagnosis, and treatment of pancreatic calculi.

A case of **typhoid pancreatitis** is reported by Moynihan.² The patient was a boy 13 years old who was in good health until September,

¹ Lancet, Aug. 9, 1902.

² Lancet, June 6, 1903.

1901, when he had an attack of typhoid fever. Since his convalescence he had complained of attacks of pain in the upper part of the abdomen. On several occasions the pain lasted for several hours accompanied by nausea. In November, 1902, for the first time such an attack was followed by jaundice, which later cleared up. Between this time and the date of operation, March 6, 1903, the attacks were numerous and the patient became more and more jaundiced. Considerable emaciation had also taken place. A distinct tenderness was present in all the region above the umbilicus; nothing abnormal could be felt. The diagnosis of typhoid infection of the gallbladder with possibly a stone in the common duct was made. When the abdomen was opened, the gallbladder was found to contain bile but no stone. The head and much of the body of the pancreas were found to be at least twice as large as the normal and almost as hard as stone. Moynihan says that he had never felt, even in old-standing cases of indurating pancreatitis, a gland so intensely hard as this was. Drainage of the gallbladder was established and kept up for 4 weeks. The patient made a very satisfactory recovery. The fluid removed from the gallbladder contained typhoid bacilli and an examination of the blood for Widal's reaction was positive. Three weeks after drainage was established the discharge contained large numbers of typhoid bacilli. The patient was put upon 10-grain doses of urotropin 3 times a day, and on the eleventh day after the commencement of this treatment there were no typhoid organisms found in the discharge.

An exhaustive article dealing with the various **diseases of the pancreas** is presented by Deaver.¹ The first part of the article deals with the anatomy and the anomalies of the pancreas. The history of pancreatic diseases, with numerous references to the literature on the subject, is also given. Injury of the pancreas is rare, owing to its protected situation. It is, however, occasionally injured by gunshot and stab-wounds. As the result of injury inflammatory cysts, especially of the lesser peritoneal cavity, are apt to develop. Chronic pancreatitis may result from bruising during operations upon the stomach and biliary passages. Prolapse of the pancreas through an abdominal wound has been reported 8 times. Acute pancreatitis is characterized by the sudden onset of pain in the epigastrium, colicky in nature and accompanied by prostration and anxiety. Vomiting is an early symptom and is severe. The diagnosis is difficult because of the obscurity of the symptoms, which are mainly those of acute peritonitis originating in the upper abdomen. The condition is most frequently confused with intestinal obstruction, which, in fact, may result from inflammatory material or a swollen pancreas producing strangulation of the duodenum. Many of the milder cases of acute pancreatitis, recover without operation. In such cases the patient should be given sufficient morphin to quiet the pain and the compression should be combated by the use of stimulants, especially salt solution and whisky by the rectum. Gastric lavage should be employed for the vomiting. In the more severe cases the abdomen should be opened and drainage be established. Extreme shock should first be treated and

¹ Am. Jour. Med. Sci., Feb., 1903.

the patient be operated upon when the condition has improved. Gangrenous and suppurating pancreatitis are accompanied, as a rule, by widely disseminated fat necrosis. The two conditions may be associated. An abscess may form as a peripancreatic collection and open into the stomach, duodenum, or colon. Thrombosis of the portal vein and infection of the liver may follow the extension of infection. The symptoms of the suppurating and gangrenous forms of pancreatitis are those of sepsis following the acute onset already referred to. In addition to these, often a tender mass can be felt in the epigastrium. Fat may be found in the stools and glycosuria may also be present. The treatment of this form of the disease is drainage. Chronic indurating pancreatitis is a more common disease than is generally supposed, and it is thought that many of the cases diagnosticated as malignant disease of the head of the pancreas are in reality of this character. The gradual and painless onset of this condition makes its diagnosis difficult, though in a certain number of cases the onset may be somewhat acute. The beginning of the condition frequently produces symptoms resembling those of a gall-stone attack. Pain, however, is more in the epigastrium, and the tenderness will be found one inch above and one inch to the right of the umbilicus. Asthenia is a constant symptom and dyspeptic symptoms and frequently diarrhea will be noted. Later a tumor will be palpated. As sequels of chronic pancreatitis are mentioned such conditions as gastrectasis, abscess of the liver, ascites, and intestinal obstruction from adhesions. Pancreatic lithiasis is difficult of diagnosis. The condition frequently accompanies chronic interstitial pancreatitis. The symptoms resemble those of biliary colic. Cysts of the pancreas are not infrequent. The situation of the cyst is variable, as is the direction of the growth. As a rule, it is adherent to the surrounding structures, especially the stomach, colon, duodenum, omentum, and anterior abdominal wall. In a few cases there are no adhesions and excision is easy. The symptoms depend upon the degree of pressure exerted upon neighboring organs. Deaver reports 2 cases in which there was neither pain nor vomiting, symptoms which are usually present. The presence of sugar in the urine and of fat and undigested proteids in the stools is inconstantly noted. Carcinoma is the most frequent new-growth occurring in the pancreas, and the head of the organ is the most common seat of the disease. The early symptoms are very vague and are often entirely lacking. The treatment of malignant disease offers little hope. Deaver closes with some remarks on the technic of pancreatic operations and with a brief report on x-ray findings in pathologic conditions of the pancreas by Wilbert.

An interesting case of **pancreatitis associated with cholelithiasis and glycosuria** is reported by Nash.¹ Cholecystotomy was performed with a good result. The patient was a man 60 years old who had attacks of epigastric pain extending over a period of 7 years. The onset of the present attack was sudden, and the pain was located in the epigastrium, accompanied with nausea, vomiting, hiccough, and collapse. In the be-

¹ Lancet, Nov. 1, 1902.

ginning the temperature was subnormal, but in the course of 2 days it rose 2° or 3° above normal. The pulse was very rapid (about 160). The whole abdomen became enormously distended, suggesting intestinal obstruction. This distention was relieved by enemas and aperients, but it quickly reappeared. With the subsidence of the distention there was increased resistance over the pancreas, giving impression of effusion into the lesser peritoneal cavity. The urine showed a large quantity of sugar when examined several days after the onset of the attack. The abdomen was opened, and fat necrosis was apparent over the mesentery and omentum in the neighborhood of the pancreas. The pancreas was enlarged, but there was no effusion into the lesser peritoneal cavity. The gallbladder contained a large calculus which was removed. The gallbladder was attached to the abdominal wall and drainage was established. The patient made a satisfactory recovery and 4 months after operation his urine was free from sugar. Nash believes that the stone in the gallbladder was accompanied by a sudden inflammation of the bile-passages and that some infection spread along the ducts to the pancreas.

The relation of **cholelithiasis to acute pancreatitis** is set forth by Joseph Wiener,¹ who describes an illustrative case. The patient was a woman 41 years of age who was suffering from symptoms which seemed to indicate an acute inflammatory condition of the appendix, although the gallbladder also was considered a possible seat of disease. The abdomen was opened along the outer border of the right rectus at the level of the umbilicus. The appendix was long and tightly bound down by adhesions; it was removed. The omentum was found to be thickly studded with small, irregular, opaque, yellowish-white patches, firm to the touch and slightly raised. A portion of the omentum was removed for examination. The gallbladder was found distended and there was a large stone in the cystic duct. The stone was milked back into the gallbladder and cholecystectomy was performed. The hepatic and common ducts were found free from stones. The head of the pancreas was hard but not enlarged. The cystic duct was ligated. The gallbladder-wall was somewhat thickened, the mucosa dark and congested with yellowish punctate areas. The stone was half an inch in length and not faceted. The portion of omentum which was removed was found to be the seat of typical fat necrosis. The patient developed pneumonia at the base of both lungs, but recovered, and left the hospital with the wound entirely healed on the twenty-second day. Wiener discusses his own case with the 32 which have been collected by Opie, and believes that in many, if not in all the cases, there is a causal relationship between the two conditions. In many of the cases there was positive proof that the duct of Wirsung was occluded by a stone. The 32 cases collected by Opie all ended fatally because of delayed operation.

In discussing **acute pancreatitis**, George Woolsey² reports 3 cases in which he has operated, with recovery in each case. In 2 of the cases there was a marked history of alcoholism, which is looked upon as causing the condition indirectly through the establishment of gastroduodenal

¹ N. Y. Med. Jour., May 16, 1903.

² Med. News, Dec. 20, 1902.

catarrh. The usual channel of infection is through the pancreatic duct. Injury is also considered a cause, but there was no history of traumatism in any of these cases. The symptoms were much alike in all of the cases, the onset being sudden with more or less collapse, indicated by pallor, feeble and rapid pulse, and general prostration, together with severe cramp-like epigastric pain not relieved by vomiting, distention of the abdomen, and irregular temperature. Abdominal rigidity develops early, accompanied by tenderness. No mass can be felt. In but one of the three cases was there obstinate constipation simulating intestinal obstruction. This is a symptom which is frequently observed in acute pancreatitis. Glucose was present in the urine in but one case, and the finding materially aided the diagnosis. Fat in the stools was not observed in any of the cases, although Robson regards it as more common than glycosuria. The diagnosis is always difficult and uncertain. The first case in this series was not diagnosed; in the second a probable diagnosis was made; the third case was diagnosed because of the typical symptoms combined with the alcoholic history and the glycosuria. Operation should be avoided in the acute early stages when the symptoms are indefinite and the patient is in a state of collapse. The operation is frequently undertaken for some of the conditions which simulate the disease, and from which it may be difficult to differentiate it, such as intestinal obstruction, septic peritonitis of unknown origin, biliary colic, etc. The prognosis is grave in all of the forms of acute pancreatitis, and is especially grave in the hemorrhagic form. In each case gauze drainage was employed which extended down to the foramen of Winslow, and in two of the cases drainage of the pelvis was also employed because of the septic fluid found in this location.

Tropical abscess of the spleen is discussed by Fontoyant and Jourdrau,¹ who report a case occurring in a man 47 years old. In this case the abscess was drained, but the patient died 2 weeks later from pernicious malaria. The abscess developed during the course of a malarial attack and followed promptly upon violent exertion. The marked symptoms were intense pain in the splenic region, dry tongue, and dyspnea, which were later followed by fluctuation. The latter symptom is very rare in splenic abscess, being present but once in 21 cases collected by Grand-Moursel. In the authors' case there was no elevation of temperature and the pus evacuated was sterile. The diagnosis in the absence of fluctuation is nearly impossible. It is suggested, however, that in malarial patients with hypertrophied spleen and who develop intense pain in the splenic region, together with dyspnea, coated tongue, etc., it would be wise to make an exploratory puncture. The treatment consists in drainage, or in splenectomy if the latter operation can be performed without infecting the peritoneal cavity.

Giuliano² discusses the question of **hemorrhagic cysts of the spleen** and reports an interesting case of this condition coming under his own care. He also briefly abstracts 15 others which he has collected from the literature of this subject. The author's patient was a man 33 years

¹ Arch. Prov. de Chir., No. 11. 1902.

² Riforma Med., Nov. 21, 22, 23, 1902.

of age. The spleen had been enlarged for several years, during which time the patient was subject every spring and fall to the quotidian type of malarial fever. The tumor was ovoid in shape, extending from the sternum and median line to the posterior axillary line and well below the iliac crest. At the upper portion the growth fluctuated. Pressure on its lower portion produced pain. An exploring needle was introduced and 160 cc. of bloody, chocolate-colored fluid was removed. This fluid contained red and white blood-cells and a few unclassified cells showing fatty degeneration. After the removal of the fluid the tumor diminished gradually in size, but later the patient developed a rather extensive peritonitis. This attack, however, was not severe, and he recovered. When he left the hospital he was not suffering pain and was only slightly annoyed by the weight of the tumor. Giuliano considers exploratory puncture necessary in order to make a definite diagnosis of this condition, and states that the treatment should be surgical, namely, puncture, or, in some cases when this fails to relieve the condition, the abdomen may be opened and the cyst-walls sutured to the abdominal wound. Splenectomy is not warranted.

A case of **multiple lacerations of the spleen due to the kick of a horse** is reported by Le Dentu and Mouchet.¹ Mouchet performed a **successful splenectomy** 8 hours after the receipt of the injury. The patient was a teamster 34 years of age who was kicked first by one horse and then by another while grooming them. He was admitted to the hospital in great shock at 6.15 A. M. The authors saw the patient at 9 A. M., when he was a little better, and they found the abdomen flat and exquisitely tender in the neighborhood of the spleen, in which region there was great pain. There was some tenderness over the rest of the belly. The thighs were flexed upon the abdomen. There had been no vomiting or hiccoughing and the patient passed flatus. There was slight dulness in the right but much more marked dulness in the left flank. It was thought that the patient had a rupture of some abdominal organ, and because of the site of the greatest pain and tenderness it was thought likely that the spleen was the viscus involved. Immediate operation was advised, but the patient would not consent. Three hours later, however, when his condition became worse, he consented, and operation was performed at 2.30 P. M., 8 hours after receipt of the injury. The patient was anesthetized with ethyl chlorid and ether and the abdomen was opened in the median line. It was found to contain a large quantity of free blood and there was no injury of the stomach or intestine. The blood seemed to come from the left side of the abdomen and there were practically no clots. In order to expose the splenic area thoroughly a transverse incision was made. The spleen was found to be the seat of numerous lacerations, many of which were subcapsular. The organ was removed, the general cavity cleansed with gauze sponges and closed without drainage. The duration of the operation was 40 minutes. An immediate subcutaneous injection of artificial serum was employed and it was repeated once a day for 6 days, during which time the patient

¹ Bull. de l'Acad. de Med., June 16, 1903.

remained in a more or less precarious condition and developed bronchitis. Two days after the operation the leukocytes numbered 27,000; 2 months later they had fallen gradually to 11,000. The patient's recovery was gradual but satisfactory. After the operation there was no enlargement of the thyroid gland or lymph-glands. The authors think that in cases of multiple lacerations of the character here described the spleen should be removed whenever possible. Although it was not employed in this case, drainage is usually advised. The operation of splenectomy for traumatism is somewhat rare in France, this being but the seventh successful case. The statistics of Mauclaire (1901) comprise 61 cases, 31 of which terminated in recovery. Berger, of Halberstadt, reports 67 cases of splenectomy, for subcutaneous lacerations only, with 38 recoveries.

A case of **laceration of the spleen with recovery after packing the wound with iodoform gauze** is reported by Stirling,¹ of Melbourne. The patient was a boy who was kicked in the abdomen by a horse. He was admitted to the hospital at 4 P. M., having received his injury early in the morning. He was operated upon at 8 P. M. The incision was made below the umbilicus and revealed an abdominal cavity filled with blood, which blood was found to come from the splenic region. The incision was prolonged upward and a rent was found on the posterior border and diaphragmatic surface of the spleen. At this stage of the operation the patient's radial pulse could not be felt. The wound was firmly plugged with iodoform gauze and saline infusion was given. The patient recovered.

A case of **splenectomy for rupture of the spleen** is reported by Marmaduke Sheild.² Rupture in this case was at the hilum and the patient had lost an enormous amount of blood. The recovery from the operation was very satisfactory.

Beaumont and Houseman³ report an interesting case of **traumatic rupture of the spleen with recovery after splenectomy** in spite of subsequent empyema. The patient was a boy 17 years old who had been run over by a wagon. There was no immediate collapse and the development of the abdominal symptoms was gradual. When the abdomen was opened, the spleen was found divided into two portions. The hemorrhage was controlled by digital compression of the pedicle and the two portions of the organ were removed. The patient was in a grave condition on the operating table, but improved after thorough stimulation. On the third day his temperature suddenly rose to 105° and he became violently delirious. On the sixth day, while the patient was still in this condition, there were evidences of effusion at the base of the left lung, and aspiration withdrew about 6 ounces of decomposed blood with almost a fecal odor. The patient's condition not improving, the abdomen was opened and the splenic stump and subphrenic regions were thoroughly explored, but no pus was found. An examination of the patient's blood at this time showed streptococci in large numbers. Within 4 days 330 cc. of anti-

¹ Intercol. Med. Jour. of Australasia, Feb. 20, 1903.

² Lancet, Oct. 25, 1902.

³ Lancet, Sept. 13, 1902.

streptococcic serum were employed. There was a fall in the temperature and return to consciousness. There was evidence of pus in the left chest 15 days after the original operation. The pus was drained away and the patient recovered. The operation was done on May 20, 1902, and on September 8 the patient was in perfect health and was following his occupation. His pulse-rate still remained between 112 and 120. After the operation there developed a general enlargement of the lymphatic glands, with anemia, but this entirely disappeared.

Eisendrath¹ discusses **traumatic rupture of the spleen**, reporting a case in which he performed splenectomy. Pathologic spleens are more prone to rupture than normal ones. Of 131 cases of splenic rupture collected by Lewerenz, 82 occurred in pathologic organs. In 292 cases of injuries of varying degree of severity of the abdominal viscera, Makins found 89 cases of rupture of the viscera. The largest number were those of the kidney (39 %); next were those of the liver (23.59 %), and third those of the spleen. Eisendrath has found the following to be the most constant symptoms in the cases which he has collected: First, severe pain, most frequently referred to the left hypochondriac region. Second, sooner or later signs of internal hemorrhage or of collapse. It is true that there are exceptional cases in which there is but little change at first, the signs of hemorrhage coming on rather late (in one case on the fourth day). Such hemorrhage may come on late as the result of dislodgment of the clot. Third, one of the most characteristic symptoms is dulness in the flanks, especially on the left side, changing with change of position. Fourth, some French surgeons and Trendelenburg have laid great stress upon rigidity of the abdominal muscles upon the side of the injury as a valuable sign of rupture of one of the abdominal viscera. It is almost impossible to differentiate between hemorrhage from a rupture of the spleen and liver, or those intraperitoneal hemorrhages due to the free communication between the seat of rupture in a lacerated kidney and the general peritoneal cavity. It may be said, in general, that the earlier the diagnosis is made, the better the prognosis. It is not denied that there are cases in which recovery is spontaneous, but they are rare; and, although the patient may recover from the immediate effects of the hemorrhage, there is great danger of the sepsis later. In order to demonstrate how operative measures have improved the mortality, it is interesting to study the cases which have been reported up to the present time. Up to 1890, 3 patients were operated upon, all of whom died. From 1890 to 1900, 34 patients were operated upon; of these, 20 recovered (58 %) and 14 died (41.2 %). From 1890 to 1902, 53 patients were operated upon, of whom 28 recovered (52.8 %) and 21 died. Treatment is operative, and consists in splenectomy, suture, or tamponage. Except for an occasional slight glandular swelling and a moderate anemia, the removal of the normal spleen causes but slight, if any, changes in the organism. "It is advisable to tampon if the tear is located on the convex surface or one of the borders and does not extend very deeply into the parenchyma, but is contraindicated if the tear is

¹ Ann. of Surg., Dec., 1902.

either deep at this place, or there is extensive pulpification of the spleen, or, lastly, if the tear involves the hilus of the organ. Under these conditions, it is far safer to perform splenectomy." While examining the seat of injury and deciding upon a mode of procedure the hemorrhage can be controlled by digital compression of the splenic vessels. The patient operated upon by Eisendrath died on the third day with peritonitis.

J. Basil Hall¹ discusses the operation of **splenopexy for wandering spleen**, taking as a text for his remarks a case in which he operated. Examining the literature on the subject, he was able to find records of only 8 cases in which splenopexy had been performed for floating spleen. The considerable enlargement of the organ, the free hemorrhage which results from sutures which penetrate the parenchyma, and the low mortality following splenectomy have caused surgeons to choose extirpation rather than to attempt fixation of a wandering spleen. Before removing the spleen, however, Hall thinks it should be demonstrated that fixation of the organ is impracticable. The case reported is that of a woman, aged 30, who presented the symptoms of a floating and enlarged spleen. When the patient stood erect, the organ could be carried nearly as far as the right iliac fossa. Hall made an incision 4 inches long at the outer border to the left rectus muscle, and was able without much difficulty to bring the spleen entirely out of the abdominal cavity. The organ measured $7\frac{1}{2}$ inches in length and $3\frac{1}{2}$ inches across its center. The pedicle was so long and the arrangement of the vessels such that the organ could have been easily removed and the separate ligations applied to the vessels. "While considering the advisability of removal, however, it was noticed that the notch on the anterior border was only 2 to 3 inches from the lower extremity of the spleen, and the depth of the notch was such that the lower pole of the spleen was only connected to the rest of the organ by a comparatively narrow isthmus. This arrangement at once suggested an easy means of fixing the organ. The main body of the spleen was therefore replaced in the abdomen after rendering the parietal peritoneum raw in the splenic fossa in order to excite adhesions. Then, while the lower pole was held in the wound, the edges of the peritoneum were drawn tight by a purse-string suture until they closely gripped the narrow isthmus in the notch. The abdominal aponeurosis was next sutured in a similar manner until it grasped the isthmus in the notch sufficiently tightly to produce marked congestion of the now isolated lower pole. The left rectus muscle was next drawn outward somewhat, so as to overlap the projecting pole of the spleen as much as possible, and the skin incision sutured. After closing the skin incision, a prominent lump the size of half an orange remained." The patient suffered a great deal of pain for the first 24 hours. Two days after the operation fluid had collected beneath the rectus muscles and around the projecting spleen; this was evacuated and a tube inserted. After this recovery was uneventful. Three months after the operation there was a hard flattened swelling to be felt in the abdominal wall; it was painless and the spleen

¹ Ann. of Surg., April, 1903.

within the abdomen was firmly attached to it. The patient was entirely relieved of the symptoms and was able to undertake her household duties even if requiring active exertion. She was perfectly well 12 months after the operation. Hall does not think that the method here practised is capable of universal application, but if feasible it will certainly anchor the spleen. To Kouwer, instead of Rydygier, is given the credit of first performing splenopexy. Brief notes are presented of the other 8 cases of splenopexy.

Ten cases of **splenectomy for malarial hypertrophy of the spleen associated with movability of the organ** are reported by Rodolfo Schwarz.¹ The average age of the patients operated upon was 43 years, and all were women. The frequency of movable spleen in women is referred to. In one case there was a thrombosis of the vessels and a necrotic area of the spleen with adhesions about the organ. In 6 cases the pedicle was twisted. The spleen was delivered in each case out of the abdominal cavity and the pedicle was then tied, silk being employed. There were no accidents in any of the operations. In but one case was it necessary to include the tail of the pancreas in the ligation of the pedicle, and this gave rise to no subsequent trouble. The spleens varied in weight from 800 to 3500 grams. There was no death as the immediate result of operation, but one patient died on the fourteenth day from peritonitis. In some of the cases there was no return of the malarial fever, but in others the fever was not affected by the removal of the spleen. Schwarz does not recommend splenectomy for simple malarial hypertrophy, but when the organ is movable the operation should be performed. In the district of Adria nearly one-half the population suffer from enlarged spleens. In a large number the condition gives rise to no symptoms. Schwarz has found that the use of quinin or the hypodermatic injections of arsenic or iodine, especially the latter remedy, will do much toward reducing very large malarial spleens. It should not be thought that the removal of the spleen will cure the malaria. Splenic enlargement is but one of the manifestations of the disease, and the treatment should be directed to the malarial infection. In many cases the operation of splenopexy cannot be successfully performed because of adhesions or because of a twisted pedicle. Because of the size of the spleen, also, splenopexy is not productive of much good.

Webster² reports an **interesting case of enlarged spleen with twisted pedicle**. The spleen extended down to and was adherent to the right side of the pelvis and was successfully removed. An unusual complication of the condition was multiple nodulation and pigmentation of the skin. The medical aspects of the case are discussed by Tieken. The diagnosis of this condition was not made prior to operation because of the peculiar situation of the tumor. The kidney was suspected as the seat of disease. Webster states that this is the only case on record, so far as he has been able to ascertain, in which an enlarged spleen has become fixed in the right side of the pelvis. The history of the condition extended over a period of 17 years.

¹ *Gaz. degli Osped.*, Aug. 24, 1902.

² *Jour. Am. Med. Assoc.*, April 4, 1903.

DISEASES OF THE RESPIRATORY ORGANS.

Freer¹ discusses at length the **diagnosis of carcinoma of the larynx**. Early diagnosis of this condition is frequently not made, because, at first, of the slight regard usually paid by the patient to the persistent hoarseness that may precede the graver manifestations for years as the only symptom, and, secondly, the widespread indifference to the acquirement of even moderate skill in laryngoscopy shown by a number of the profession. The great importance of careful inspection of the larynx is shown, and a strong plea made for an early diagnosis. At present the cases usually come late to the operator. Chronic hoarseness in a man past 40 makes laryngoscopic examination an imperative duty to all practitioners. None of the symptoms of carcinoma is of much value in proving its absence, but they are of great use in arousing suspicion of its existence. Positive diagnosis rests upon the use of the laryngoscope and microscopic examination of sections of the growth. The author's article is numerously illustrated with cuts representing carcinoma in various stages. The differential diagnosis between tuberculous and syphilitic tumors and ulcers and carcinoma is carefully detailed. Freer urges the removal of portions of a suspected growth for microscopic examinations. The piece removed must be taken from the center of the growth and the instrument should be crowded in deeply. The author prefers Schiemann's forceps for this purpose. Although strongly urging the use of the microscope as one of the means for making a diagnosis, it is stated that it would be a mistake to follow its results blindly and without a corroboration from clinical appearances. [We believe that it is not from the center of the growth the piece should be taken for examination but from the edge. Further, the piece should contain some of the apparently sound tissue. Atypic epithelium from the center of a growth suggests but does not prove the existence of cancer. Proof is afforded by epithelial infiltration of tissue at and beyond the edge.]

Ingals² has reported a case of **laryngectomy for carcinoma**. The operation was performed by the late Christian Fenger. The patient was a man aged 47. The symptom of hoarseness began 18 months before he applied for treatment. The growth began as two small smooth nodules involving the middle third of the left vocal cord. Ingals performed preliminary tracheotomy, and Fenger later removed the entire larynx, as the growth had at this time perforated the walls of the larynx. Fenger's remarks made at the time of the operation are quoted in full. He called attention to the fact that laryngoscopic appearances gave no idea of the extent of the disease. The patient recovered from the operation, but a pharyngeal sinus persisted.

Ricketts³ (Cincinnati) presents an exhaustive communication on **lung surgery**. The subject is considered from the historical, experimental, and statistical standpoint. His conclusions regarding the various opera-

¹ Jour. Am. Med. Assoc., Feb. 14, 1902.

² Jour. Am. Med. Assoc., March 7, 1903.

³ N. Y. Med. Jour., March 21, April 18 and 25, May 9, 1903.

tive procedures are as follows: "*Pneumonotomy*: (1) Emergency surgery precedes elective surgery, and surgery of the lung is not an exception to the rule. (2) One can hardly imagine a pathologic condition in the lung that has not been dealt with surgically, with more or less success in emergency cases. (3) This being true, the same methods may be applied in selected cases, with even better results, if the more modern surgical principles be employed. (4) Severing one or more of the larger pulmonary bloodvessels results in instant death. (5) If death does not result within a few minutes, bleeding will be slow and gradual. (6) If bleeding is slow and gradual, it may require hours or days to cause fatal exhaustion. (7) If death does not occur until after the end of the second day following severe bleeding, infection is its cause. (8) All or part of the escaped blood may pass through the opening in the chest into the bronchus or alimentary tract. (9) The blood may escape into the pleural cavity or cavities, pericardial or peritoneal cavity, or all of them, and thereby become concealed. (10) More definite knowledge of conditions and symptomatology is necessary that surgery of the lung may be perfected and made more aggressive and general. (11) Abnormalities, congenital or acquired, must always be considered in dealing surgically with the lungs. (12) Atelectasis and apneumotosis should be cared for by relieving the compression by removing the cause. (13) The same surgical principles can be applied to the lung as to other organs of the living body. (14) The bony chest may be opened for exploration of the lung with as little danger as opening the abdomen, cranium, articulating capsules, kidney, liver, pancreas, spleen, stomach, gut, or hepatic ducts. (15) Hermetically closing the chest is irrational, unscientific, and dangerous. (16) Closing the chest wound by any means does not prevent the escape of blood from injured pulmonary vessels into the pleural cavity. (17) All wounds of the chest-wall, whether penetrating or nonpenetrating, should be treated antiseptically, and with reference to drainage. (18) No instrument or needle should be made to enter the lung tissue for exploration or the removal of fluid unless the bony chest has previously been opened. (19) Foreign bodies in the bronchi or parenchyma of the lung may be detected with a fine exploratory needle through an open chest with the lung contracted. (20) Foreign bodies in the lung and bronchi when causing serious symptoms should be removed. (21) Some small foreign bodies become encysted and remain harmless. (22) The position of a foreign body in the lung changes with expansion and contraction of the lung. (23) Hemorrhage, when due to pulmonary tuberculosis, should not be allowed to become fatal without opening the bony chest, and the application of pressure by forceps, gauze, or otherwise. (24) Bleeding of the lung from any cause will in many cases cease when the lung is allowed to contract upon itself with an open chest. (25) Blood-clots within the pleural cavity should be removed at the time they are discovered, whether infected or not infected. (26) Blood-clots in the pleural cavity may become organized with or without adhesions of the parietal and visceral pleura, or they may become infected and cause most serious consequences. (27) Hemoptysis may be absent in the most

severe lacerations of the lung. (28) If bleeding from larger pulmonary vessels results, forceps should be applied. If not, gauze should be securely packed in the cavity. (29) Drainage of pulmonary cysts of any character can be done with the same success as in any other organ. (30) Incision for drainage should be done with or without the presence of adhesions. If without adhesions, the opening in the chest should be at the lowest point of the pleural cavity for gravity drainage. (31) Many incisions of the lung may, and should, be made with or without even local anesthesia. (32) It is probable that but few will necessitate the use of general anesthesia. (33) Abscess of any character and of any location in the lung should be found and opened. (34) Gangrene of the lung demands most radical surgical measures, such as opening the chest, drainage, and the removal of all necrotic tissue. (35) Polypi of the bronchi seldom necessitate removal, but they may cause conditions which may require surgical intervention.

"Pneumonorrhaphy: (1) Silk, silkworm-gut, and animal tendons are the most desirable materials for lung surgery. (2) Absorbable sutures and ligatures are, as a rule, not to be relied on as to strength and durability. (3) Silk and silkworm-gut may become encysted in the lung and remain harmless. (4) The tug and a combination of the tug and tobacco-pouch sutures constitute the most desirable ones to use in the lung. (5) Ligatures and sutures may be dislodged by sudden expansion of the lung due to sudden closing of the opening in the chest-wall. (6) The blood-vessels, bronchi, and lung tissue should be ligated separately, great care being taken not to include too much tissue of any kind in one ligature. (7) Needles to be employed in lung tissue should be round, with a rounded point. They should never have a sharp point, or sharp edges. (8) Not all ruptures, punctures, or lacerations of the lung require suture, or any surgical intervention whatever. (9) Many lacerations of the lung without fracture of the bony chest can, and should, be treated by suture, compression with gauze or forceps. (10) Puncture of the lung from any cause (such as stab and gunshot) resulting in hemorrhage should be treated by opening the chest, and the application of ligature or compression. (11) Rupture of the lung should be treated as laceration.

"Pneumonectomy: (1) A portion of all of one lobe, or the entire right or left lung, may be removed without causing death. (2) For complete or partial lacerated portions of the lung when severe, pneumonectomy is necessary and should be done. (3) Gangrene of the lung requires in many cases removal of all necrotic tissue. (4) Hernia of the lung, when sudden and of but few hours' duration, should as a rule be amputated, and the stump fixed in the chest-wall, as there is no sac. (5) Hernia of the lung coming on gradually has a sac, and should be returned to the pleural cavity, if possible without amputation.

"Pneumonopexy: (1) This is the safest and most rapid way of dealing with the stump of lung tissue in the majority of cases necessitating excision for any cause. (2) Adhesions of the parietal and visceral pleura have without exception taken place, where either has been lacerated or incised, with or without suture. (3) The degree of adhesion corresponds

with the degree of injury. (4) Cysts of the lung of any character can best be drained through visceroparietal adhesions. In the absence of adhesions the wall of the cyst may be sutured to the edges of the opening in the chest-wall, drainage to be at once accomplished or at some subsequent time."

DeForest Willard¹ presents a paper on the **surgery of tuberculous cavities of the apex of the lung**, including extensive references to the literature, a table of cases operated upon, and a report of a number of experiments upon lower animals. His conclusions as to operation in the human being are as follows: "(1) With improvement in technic pneumonotomy will become a practicable operation, even in cavities at the apex. The operation would be especially helpful in the early period of cavity formation, but it is exceedingly difficult at this stage to obtain the consent of the patient, since hygienic and dietetic methods of treatment often result in cure. (2) In advanced cases both tubercular and streptococcic infection are often present; the cavities are usually multiple and the operation cannot cure. It may be employed, however, as a palliative to cough, hemoptysis, and sepsis. (3) In abscess of the lower lobes, following pneumonia or pleurisy, whether tubercular or not, incision and drainage are to be recommended in any stage. (4) Pneumonectomy in our present stage of surgical and diagnostic skill is not advisable in tuberculosis. (5) With improved technic tubercular foci will in the future be eradicated, as we now eradicate tuberculosis in joints and other tissues. An efficient and certain method of producing strong adhesions between the two layers of the pleura at the site of the disease is the most important step in this technic. (6) The careful and methodic application of auscultation, percussion, and the x-ray for the accurate locating of the diseased focus is also an important factor in securing a safe operation. (7) Pneumothorax is so serious a menace to life that in all operations on the lung, an artificial respiration apparatus, like the Fell-O'Dwyer or Matas instrument, should be at hand, together with a full jar of oxygen." The following is a condensed summary of the tables presented. "The production of adhesions is a most important part of the operative procedure. If these can be secured, either artificially or if they are present from the disease itself, the operation is not more serious than many major operations. In the human being the position of the abscess can be much more definitely fixed than in the dog by auscultation, percussion, and the x-ray. Operation, therefore, becomes one of greater certainty. If slight adhesions only are found, immediate stitching of the lung to the walls around the margin of the opening, while not avoiding pneumothorax, may escape pyothorax. If pneumothorax occurs, the most speedy method of relief is that of dragging the lung into the opening and fixing it, thus giving greater action to the opposite lung. Excision of the diseased area would be the best operation, provided the entire tuberculous portion could be definitely removed, a condition which at present does not seem possible. In dogs even a collapsed lung becomes functionally active in a few days after excision of a portion."

¹ Jour. Am. Med. Assoc., Sept. 20, 1902.

Whitacre¹ (Cincinnati) discusses the **surgery of pulmonary tuberculous lesions** and reaches the following conclusions: "(1) The excision of the pulmonary lesion is, in the vast majority of cases, both impossible and irrational. (2) The incision and drainage of tuberculous cavities in the lung does not seem to be a justifiable operation. (3) The nitrogen compression-method of Murphy is a rational procedure in a limited number of selected cases, its application is safe, the effect on the tubercular lung seems favorable, and the reported results are encouraging. (4) Thoracoplasty, while based on the same sound principles that give value to the nitrogen method, is an extensive operative procedure involving great risk to life, and furnishes slight promise of improving the percentage of cures obtained by climatic treatment."

After a discussion of **empyema in children**, based upon an experience in the Children's Hospital of Boston, F. J. Cotton² reaches the following conclusions: "(1) Empyema in children usually follows lobar pneumonia —after a varying interval. (2) The infection is usually with the pneumococcus. (3) Spontaneous cure, even when aided by tapping, is rare. (4) Operation should not be delayed, as time lost is strength lost, and the issue is largely one of nutrition. (5) The best form of operation is in general the subperiosteal resection of an inch of the eighth or ninth rib in the posterior axillary line, the evacuation of pus and fibrin masses, and tube drainage. (6) Irrigation at or after operation is not usually advisable. (7) The routine after-treatment in fresh cases should be tube-drainage, the tube being progressively shortened, and removed when the cavity is nearly healed. (8) When failure to heal seems to depend on failure of the lung to re-expand, treatment by valve or suction apparatus is indicated. This is especially of value in the more chronic cases. (9) The mortality is about 1 in 7; in small children it is much greater than in those over 5 years. The causes of mortality are, in the main, beyond our control. (10) The great majority of cases heal even when the healing is delayed for many months. Chronic empyema, in the strict sense, is rare in children. (11) The closure of the cavity depends mainly on nutrition and on adequate drainage. (12) Recurrences may occur from faulty drainage at any time, and they may occur years after apparently sound healing, without obvious cause. (13) Deformity of the chest is usually temporary and yields to treatment. (14) Long-continued discharge from the cavity is not infrequently followed by chest deformity and scoliosis of a severer type, permanent and sometimes extremely severe." The accompanying illustration (Fig. 45) shows the apparatus employed.

The following is a summary of a communication by C. N. Dowd³ on the **surgical treatment of empyema** based upon 75 cases occurring in St. Mary's Hospital for Children, in New York: "(1) For simple cases of empyema the following treatment is used: Excision of about 1½ inches of the seventh or eighth rib in the posterior axillary line; light ether anesthesia is usually employed; the purulent coagula are removed; short

¹ Jour. Am. Med. Assoc., Sept. 27, 1902.

² Boston M. and S. Jour., July 17, 1902.

³ Med. News, Sept. 13, 1902.

rubber tubing, cut partly across, doubled and held by large safety-pins, is used for drainage; abundant gauze dressing is applied and changed when saturated. (2) If the patient's condition contraindicates general anesthesia, an incision into the chest may be made between two ribs under cocain anesthesia. (3) Aspiration is only used to give temporary relief in patients who are in great distress from the pressure of the fluid, or temporarily to relieve the second side of a double empyema after the first side has been opened. (4) The patients are allowed out of bed as soon as practicable, and the expansion of the lung is encouraged by forced expiration. (5) Irrigation is used only when there is a foul-smelling discharge from necrotic lung tissue. (6) Secondary operations

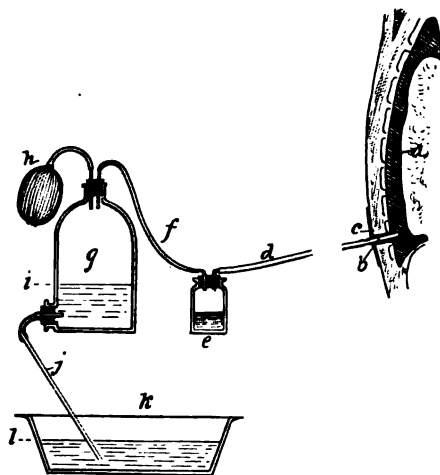


Fig. 45.—Suction apparatus. *a*, Chest cavity; *b*, tube in opening; *c*, sheet-rubber and gutta-percha gummed down with chloroform to make air-tight joint; *d*, tube connecting chest with; *e*, the catch-bottle into which the discharge is drawn; it is connected by the tube *f* with *g*, the air-reservoir bottle; *h*, suction syringe used to exhaust air from bottle *g*; *i*, tube connecting the water in *g* with that in basin *k*. The column sustained is represented by the difference in height of the water-levels *i* and *l*. It can be increased at will by pumping the bulb *h* (Cotton, in *Boston M. and S. Jour.*, July 17, 1902).

are not done until good opportunity has been given for healing; usually 3 or 4 months should have elapsed after the primary operation, and there should have been no noticeable improvement for about a month. (7) In the secondary operation the expansion of the lung should be encouraged by incising, stripping back, and, if necessary, removing portions of the thickened pulmonary pleura. (8) The examination of 44 of the patients at long periods after operation indicates that recovery is usually complete in the simple cases, and that there is surprisingly little deformity in most of the severe cases."

Rolleston and Trevor¹ report a case of **primary sarcoma of the lung simulating empyema**. The condition occurred in a girl 13 years of age. The clinical

interest in this case is the close imitation of an empyema as shown in the physical signs on the right side of the chest; edema of the chest-wall in the right axilla, the displacement of the heart, and the raised temperature. The condition ran a very acute course, the whole duration of the illness being 12 weeks. At the necropsy it was found that the entire right lung, except the apex of the upper lobe, was replaced by a soft growth of the consistence of gruel. The growth was firmly adherent to the ninth and tenth ribs in the axillary region. The authors present a table of pulmonary malignant disease containing 58 cases of primary carcinoma of the lung, 8 cases of primary sarcoma of the lung,

¹ *Brit. Med. Jour.*, Feb. 14, 1903.

16 cases of primary carcinoma of the bronchi, and 2 cases of primary sarcoma of the bronchi.

Karewski and Unger¹ have conducted a series of experiments upon animals with the object of discovering a more rapid and satisfactory method of producing pleuritic adhesions. The ultimate object of course was to avoid complications, particularly pneumothorax, in the performance of transpleural operations. After trying a number of materials, the authors finally found that the employment of silk sutures soaked in turpentine resulted in the production of adhesions which after 4 or 5 days were sufficiently dense to form a thorough protection to the remaining portion of the pleural cavity. The experiments of the authors were confined to animals.

John O'Connor² (Buenos Ayres) discusses the **treatment of pulmonary hydatids**, and reports 3 cases upon which he has operated. It is stated that the prevalence of hydatid disease in the Argentine is not generally known. During the past 8 years O'Connor has operated upon 84 cases of hydatid disease. In 56 the liver was involved; in only 3, the lung. The diagnosis of pulmonary hydatid disease may be attended with much difficulty, especially in cases in which the cyst has not ruptured into a bronchus. In such cases the family and personal history of the patient and the locality in which he has resided are of much value. The unilateral situation of the affection, with probably a sharply defined outline, not corresponding to the usual site of a pleural effusion or hepatic enlargement, taken in connection with diminished breath-sounds, vocal and tactile fremitus, with an antecedent hacking, irritating cough associated with bronchitic sputum, should lead one to suspect hydatid disease. When rupture has taken place, there is a history of a sudden evacuation of a quantity of fluid followed by frequent and at times considerable hemoptysis. Later an intrapulmonary pus sac may develop, in which case general toxic symptoms promptly arise. Microscopic examination of the sputum is the only positive means of making a diagnosis. The absence of the usual symptoms does not negative the presence of a cyst, since symptoms may be absent because of the deep situation of the cyst. Great stress is laid upon the value of the personal history, particularly the existence of a hacking cough with or without pain in the chest. The use of the exploring needle is advocated, not only as a diagnostic aid, but for localizing purposes. While advocating the use of the needle, O'Connor mentions that in two hepatic cases rather alarming transitory toxemia followed the exploratory puncture. He therefore makes it a practice to perform such exploration under anesthesia on the operating table. On discovering and localizing the cyst, he immediately operates. If fluid is found, the syringe is detached and the needle remains in position and is utilized as a guide to locate the cyst. As soon as the pleura is incised the lung is caught by two bullet-forceps and is rapidly drawn into the wound. By this manœuvre the confusing storm consequent on a collapsed lung is obviated and the pleural cavity is kept free from blood and hydatid fluid. The lung is held firmly in

¹ Deut. med. Woch., May 7, 1903.

² Lancet, May 23, 1903

position until the cyst is opened, and its cut edges are then sutured together with the cyst-wall to the external wound. The endocyst is removed by the gentle application of a long forceps. Free drainage is established. The after-treatment is tedious, as there is a tendency to closure of the external wound before the cavity in the lung is obliterated. Of the 3 cases here reported, 2 were very serious, but all the patients recovered after operation.

An unsuccessful attempt to remove a **foreign body** from one of the main divisions of the **left bronchus by posterior bronchotomy** is reported by Andrews.¹ The patient was a boy of 15 years, and the foreign body was the squeaker of a doll. There was absolutely no doubt about the position of the body in the bronchus. Two unsuccessful attempts were made to remove it through a tracheotomy wound, and, failing in these, Andrews resected the third, fourth, fifth, and sixth ribs between the scapula and the vertebral column and explored the lung and bronchi from behind, but could not locate the body. The discharge from the posterior wound later became purulent and required drainage with a tube. The patient continued for some time to expectorate purulent matter; he ultimately recovered, though the foreign body was never seen. A skiagraph taken after recovery showed no foreign body present, although a picture made the night before the operation showed the squeaker plainly. Every possible avenue of escape for the foreign body was carefully watched. Andrews cannot in any way account for its disappearance. He refers to the literature relating to the operation of posterior bronchotomy.

James F. Baldwin² reports an operation by which a **knife-blade was removed from the lung**. [This case closely resembles a case reported by Korteweg, of Leyden (see YEAR-BOOK, 1903), in which a piece of lyddite-shell was removed from the lung. Baldwin's case antedated Korteweg's by two years.] The patient was a young man, about 28 years of age, who was stabbed with an ordinary pocket-knife, the blade of which broke off in the lung. The knife entered just below the axilla. The wound healed promptly, but the patient later developed consolidation of the lung with accompanying purulent expectoration, and the ordinary manifestations of infection. Two radiographs were taken. They showed definitely the situation of the foreign body, which measured $1\frac{1}{2}$ inches in length and $\frac{1}{2}$ inch in width. About an inch of the rib overlying the foreign body was resected and the latter was easily removed. There were adhesions between the lung and the thoracic wall. The knife-blade was encountered at a depth of about a finger's length. There was an offensive purulent discharge for some days. The patient recovered.

Brokaw³ reports a **case of removal of an upholsterer's tack from the right bronchus**. The patient was a child, 8 years of age. When the patient was seen by Brokaw, the tack had remained in the bronchus nearly a month. At this time it was easily located with the Röntgen rays. A reproduction of the radiograph accompanies the report. A low

¹ Lancet, May 9, 1903.

² Ann. of Surg., March, 1903.

³ Ann. of Surg., Dec., 1902.

tracheotomy opening was made; the tracheal mucous membrane was cocaineized and a large endoscopic tube introduced, but owing to the accumulation of blood and mucus the tack could not be seen. A futile attempt was made to remove the tack with a pair of laryngeal forceps. The child's condition became grave, and the operation was stopped. Ten days later the patient was again anesthetized and a powerful electro-magnet was introduced through the tracheal wound. Although the tack could be felt with the magnet, it was too firmly embedded to be withdrawn by this means. The endoscopic tube was again introduced into the right bronchus; the tack, however, could not be seen because of the blood and mucus. It was finally caught with the laryngeal forceps passed through the tube, but the head of the tack was so large that it could not be made to enter the tube. Removal was finally accomplished by withdrawing the tube and forceps together. The child made an uneventful recovery.

Kellock¹ reports a case of foreign body impacted in the left bronchus which was removed through a tracheotomy wound. The patient was 2 years of age. On the day previous to admission she had swallowed some dry uncooked haricot beans, and immediately afterward was seized with an attack of dyspnea and cyanosis. A second attack followed some hours later and the child was sent to the hospital. With the exception that the entire left lung was functionless the child appeared well and comfortable. After her admission, however, it was noticed that her face became dusky in color when she cried. In view of the history, and the physical signs presented, it was thought wise to perform tracheotomy. When the trachea was opened, a probe passed into the left bronchus came in contact with the foreign body. Numerous futile attempts to remove it were made with forceps. It was finally extracted by the use of a silver wire loop, which method is strongly recommended by the author. The tracheal wound was closed completely in layers, healed primarily, and the child recovered. The bean was $\frac{3}{4}$ of an inch in length and $\frac{1}{8}$ of an inch in width.

DISEASES OF THE VASCULAR SYSTEM.

Peyrot² reports a most interesting case of gunshot wound of the heart operated upon successfully by Launay. Reference is made to the literature and statistics in cases of stab-wounds and gunshot-wounds of the heart. In cases of single stab-wounds there have been 6 recoveries out of 20 cases. Gunshot-wounds are much more serious and difficult to treat, since 17 % of them are double, whereas in stab-wounds but 1.2 % are double. Marion and Bouglé have both sutured double wounds, but each of the patients died. The cause of death, however, in Bouglé's case was pulmonary hemorrhage subsequent to the suture of the heart-wound. The case here reported, which was operated upon by Launay, is the first to recover after a double gunshot-wound of the heart. The patient was a man 26 years of age who had been shot about midnight; he was seen by Launay at 3.30 A. M. At this time the patient was very

¹ Lancet, Nov. 15, 1902.

² Bull. de l'Acad. de Méd., July 29, 1902.

weak, the pulse being uncountable, but he was able to speak enough to give an account of the injury. The external wound was at the nipple, and from it there was a small amount of bleeding which was intermittent. The heart-sounds were indistinct, but a splashing sound could be heard. There was also evidence of blood in the pleura. A diagnosis of probable wound of the heart was made. Chloroform was administered and an osteoplastic flap turned back containing a portion of the fourth, fifth, and sixth ribs. When the flap was turned back, there was a complete pneumothorax with a large amount of blood also in the pleural cavity. There was a perforation of the thin edge of the lung by the bullet. There was a small wound of the pericardium from which the blood flowed slowly but persistently. This was enlarged and a wound of the left ventricle found 2 cm. from the apex. The bleeding was not in jets, but occurred only during diastole. This wound was easily closed with a catgut suture. Examination of the posterior surface of the heart was somewhat difficult, but the wound of exit was found when the finger was placed under the apex and the heart tilted up. It was situated near the base of the left ventricle. A traction suture was placed in the heart-muscle in order to give access to the wound, which was closed with two sutures of catgut. The pericardium was cleared of clots and partially closed. The pleura was treated in the same way, both cavities being drained. During the operation 2 liters of salt solution was injected into the subcutaneous tissue. The operation lasted about 35 minutes. The pulse remained uncountable throughout, although the heart had never ceased to beat. The next day the patient was remarkably comfortable and in good condition. His pulse was of good volume, from 100 to 120 per minute. There was a slight rise of temperature for two days, but it then subsided. The drains were removed 48 hours after the operation. The patient was out of bed on the tenth day and made an excellent recovery.

Miles¹ reports a case of **suture of the heart for penetrating wound**. The patient was a man aged 25, who was admitted to the hospital a half-hour after receiving a stab-wound in the left chest. He was in a state of collapse and unconscious. The radial pulse was imperceptible; respirations were rapid and superficial. The wound of entrance was at the upper border of the sixth rib 1.5 cm. from the edge of the sternum. It measured 2.5 cm. in length. The area of cardiac dulness did not seem to be increased, and the heart-sounds, though very faint, could be heard. There was no effusion of blood into the pleural cavity. The fourth and fifth ribs were divided and turned back. The pericardial wound was enlarged and an enormous quantity of blood escaped. A wound of the right ventricle about 1.5 cm. in length was seen. Bleeding from this point was controlled by a pressure of the thumb and forefinger, and a silk suture was introduced which stopped the bleeding almost entirely. Three other more superficial sutures were then inserted. The pleural and pericardial cavities were each drained by a piece of iodoform gauze. After the operation the patient rallied and was able to give testimony regarding his injury with perfect clearness of mind. He later

¹ Il Policlinico Sezione Pratica, Feb. 14, 1903.

grew weak and died 15 hours after the operation. At the necropsy the suture of the heart was found to be perfect, but in addition to the wound of the right ventricular wall, one of the muscoli papillares was found to be divided, and there was also a penetrating wound of the intraventricular septum.

Two cases of **penetrating wound of the left ventricle** are reported by Giordano.¹ The first patient was a man aged 23, and the wound was in the sixth intercostal space, 1 cm. external to the nipple. There was a marked hemothorax at the time of admission. The wound in this instance was at the outer margin of the left ventricle, near the apex. It was closed with two silk sutures. Drainage was introduced and the wound closed. The patient rallied somewhat, but died in 1½ hours after operation. The second patient was a suicide 26 years of age who presented two wounds, one in the fourth and one in the sixth intercostal space. A wound 2 cm. long was found in the left ventricle. This was closed with two silk sutures and drainage introduced. After a long illness, due to the development of suppuration under the third costal cartilage near the sternum, and causing necrosis of the sternal end of the fourth and fifth ribs, which were later resected, the patient recovered.

Hill² (Montgomery, Ala.) adds another to the **successful operations for suturing stab-wounds of the heart**. The patient was a negro 13 years of age. The external wound was situated in the fifth intercostal space a little to the right of the left nipple. The wound was in the left ventricle and measured ¾ inch in length. It was closed with one suture of catgut. The operation was performed 8 hours after the receipt of the injury under chloroform anesthesia. The patient made a good recovery. The author presents a list of 39 reported cases of operation for penetrating wounds of the heart, and draws the following conclusions: "(1) That any operation which reduces the mortality of a given injury from 90 % to about 63 % is entitled to a permanent place in surgery, and that every wound of the heart should be operated upon immediately. (2) Whenever the location of the external wound and the attending symptoms cause suspicion of a wound of the heart, it is the duty of the surgeon to determine the nature of the injury by an exploratory operation, as is recommended by Professor Vaughan. (3) Unless the patient is unconscious, and corneal reflex abolished, as in Pagenstecher's case, an anesthetic should be given, and preferably chloroform. Struggling is liable to produce a detachment of a clot, and renew the hemorrhage, as occurred in Parlavecchio's patient. (4) Never probe the wound, as serious injury may be inflicted upon the myocardium. (5) Rotter's operation renders access to the heart extremely easy, and should be generally adopted. (6) Steady the heart before attempting to suture it, either by carrying the hand under the organ and lifting it up, or, if the hole is large enough, introduce the little finger, as Parrozzani did, which will serve the double purpose of stopping the bleeding and facilitating the passage of the stitches. (7) Catgut sutures should be used, as wounds of the heart heal in a remarkably short time. The sutures should be interrupted, introduced and tied

¹ *Gaz. degli Osped.*, Jan. 11, 1903.

² *Med. Rec.*, Nov. 29, 1902.

during diastole, not involve the endocardium, and as few as possible should be passed commensurate with safety against leakage, as they cause a degeneration of the muscular fiber with its tendency to dilation and rupture. (8) In cleansing the pericardium it should be sponged out, and no fluid poured into the sac. (9) It hardly seems necessary to accentuate the fact of the necessity of perfect cleanliness in these operations whenever the urgency of the case does not require instant intervention, as in the patients of Longo and Ninni. (10) The wound in the pericardium should be closed, and should symptoms of compression arise, reopen the wound and drain as Rehn did."

Gibbon¹ reports a case of **penetrating wound of the heart** in which he made an **unsuccessful attempt at suturing**. The patient was a negro 25 years old, admitted to the Pennsylvania Hospital a few minutes after receiving a stab-wound of the chest. When Gibbon saw him, a half-hour after the injury, the radial pulse could not be counted, and the patient was in a state of semi-unconsciousness, although any manipulation produced a great deal of restlessness. He was immediately removed to the operating room, the heart was rapidly exposed, and a large amount of blood-clot was evacuated from the pericardium. A wound of the right ventricle which measured 1.5 cm. in length was discovered. As soon as this opening was found the finger was introduced into the wound. This controlled the bleeding, and one catgut suture was introduced. At this time the heart, which had been making desperate efforts to perform its function, ceased to beat, and in spite of manipulation did not resume its action. The pleural cavity was not opened by the stab, but was opened unintentionally during the resection of the third costal cartilage. An interesting point in this case is the fact that respiration continued for about two minutes after the heart ceased to beat. Reference to the literature of this subject is made, and the reported cases are discussed.

An exhaustive study of the **surgery of the heart** is presented by Ricketts.² The following are the conclusions reached by the author: "(1) The heart may have only one auricle and one ventricle, or it may have five cavities. (2) The heart may be in the right thoracic cavity or in the abdominal cavity. (3) Removal of the pericardium does not of itself cause death. (4) It may, however, cause death subsequently, as the result of extensive cardiopneumonic adhesions. (5) Exploration of the walls and chambers of the heart with a knife or needle for foreign bodies or pathologic conditions should be done, but only after the pericardium has been opened for ample space. It is rational, justifiable, and safe. (6) Not all wounds of the myocardium will require suture, but the pericardium should be opened to remove clots and make drainage available. (7) A myocardial abscess or cysts of any character can be incised by knife or needle and drained through an open pericardium. (8) Gangrene of the heart demands incision of the pericardium and drainage of the pericardial cavity. (9) Malignant disease of the heart at

¹ Phila. Med. Jour., Nov. 1, 1902.

² N. Y. Med. Jour., May 16-23, and June 20-27, 1903.

this time resists treatment of any kind. (10) Aneurysm, mitral stenosis, hypertrophy and dilation of the heart may be more or less successfully dealt with by surgical methods yet to be determined. (11) The injection of hot water or gelatin into angiomas of the heart may add to the solution of their treatment. (12) Aneurysm of the coronary artery should be treated by proximal ligation. (13) Ligation of one coronary artery at its origin or elsewhere will not of itself produce death. (14) Rupture of the heart, spontaneous or otherwise, demands suturing (immediate death does not always occur). (15) Pedunculated tumors upon the external surface of the heart can be successfully removed. (16) Pedunculated tumors within the cardiac chambers may also be removed. (17) Lacerated, incised, and punctured wounds (penetrating or nonpenetrating) of the heart can be successfully sutured. (18) Suture of wounds in the aortic arch can be successfully done. (19) Interrupted sutures of fine silk and the smallest practicable needle are preferable for suturing the heart and ligating the coronary artery. Continuous sutures should not be used; if one breaks all are lost. (20) Suturing or any other surgical procedure should not be discontinued because of the heart ceasing to pulsate. The work can and should be completed in a much shorter time on a quiescent heart. (21) Divulsion of the sphincter ani and all methods of resuscitation should be persistently followed while operation is being conducted. (22) The removal of cardioliths (intramyocardial or within the chambers) is possible, and should be attempted when they cause serious trouble. (23) The x-ray will greatly aid in determining their presence. (24) They are usually in the apex of one of the ventricles of bipeds. (25) When found in the myocardium, they are usually in the ventricular wall (most frequently that of the left, which is thicker), and, as a rule, are contained within a cyst. (26) There have been about 53 operations upon the heart for injury, with 18 recoveries."

A detailed account of a case of **pyopericarditis, pyopneumopericarditis, and pneumococcus pyemia** is reported by Sibley, Lane, and Rowell.¹ The patient was a boy 16 years of age, and the conditions mentioned developed subsequent to pneumonia of the left base. After an apparent crisis on the eighth day there was a return of febrile temperature for 5 days and then a subnormal temperature for 8 days, during which time there existed the *pulsus paradoxus*. At no time was there an endocardial or exocardial murmur heard. At this time a localized empyema was evacuated. The pus was found to contain pneumococci in considerable numbers. The relief to symptoms was not marked, however, although the pulse became of better volume and more regular. Ten days later the patient was anesthetized, and when Lane inserted the finger into the opening in the anterior chest-wall which had been made for the drainage of the pleural cavity, he discovered a distended pericardium. He forced his finger through the wall of the pericardium and a large quantity (about 10 ounces) of pus escaped into the pleural cavity and externally. A slight elevation of temperature with general improvement

¹ Brit. Med. Jour., May 23, 1903.

followed this procedure, but the patient died 13 days later. Great numbers of pneumococci were found in the blood of the patient and death was due to a general pyemia of pneumococcal origin.

Latham and Pendlebury¹ report a case of **extensive pericardial effusion** occurring in a man 53 years of age in which Pendlebury successfully drained the pericardium. Some weeks before performing the operation, however, he tapped the pericardium and withdrew 95 ounces of fluid. When drainage was instituted, the sac contained but 20 ounces. After drainage was established the patient's general condition, which had been very bad, rapidly improved. The sinus remained open for 3 weeks. The sac was drained after the method of Allingham and Ogle, which consists in the establishment of drainage at the lowest point of the sac. [By the method of Ogle and Allingham the surgeon opens the pericardium from below through the diaphragm. An incision is begun at the costo-xiphoid angle and is carried down along the seventh left costal cartilage. The cartilage is retracted upward and outward and discloses the fibers of the diaphragm and the cellular interval between the diaphragmatic attachments to the xiphoid and to the cartilage of the seventh rib. This cellular interval is enlarged by tearing or cutting and a fatty mass is reached. This mass of fat is just above the diaphragm, in front of the pericardium and back of the sternum. By pulling down the fat and the diaphragm the pericardium is exposed and can be incised at its lowest point.]

Ricketts² gives the careful study of his **experiments upon a number of dogs** with reference to **cardiotomy** and **cardiorrhaphy**. The author explains carefully the technic which he practised. The heart can be handled to a remarkable degree without any appreciable change in the beats. Exposure of the heart, however, results in its dilation, since the support afforded by the pericardium is removed. Before suturing a wound in the heart, the flow of blood can be controlled by light pressure; it is not necessary to press hard enough to prevent the action of the organ or to bring its walls in contact. If during manipulation the heart ceases to beat, the wound in the heart should be kept closed with the finger and the wound in the chest-wall should be closed as nearly as possible. This maneuver helps to restore the support of the heart. The Glover continuous suture is preferable to all others. The weight of opinion is in favor of interrupted sutures of twisted silk. The smallest possible silk and needle should be employed; the objection to kangaroo tendon and catgut sutures is that a large needle is required to pass them. Some wounds which enter the heart-muscle do not require suturing, as they will close and heal spontaneously. In speaking of his results Ricketts says that we can ligate either of the coronary arteries at any point of their distribution without producing death.

Sir Isambard Owen³ reports a case of **perforation of the aorta by a pin** which was lodged in the esophagus. The patient was a man 53 years of age who was admitted to the hospital suffering from pain in

¹ Lancet, March 21, 1903.

² Jour. Am. Med. Assoc., Nov. 15, 1902.

³ Brit. Med. Jour., June 27, 1903.

the chest and giving a history of repeated attacks of hematemesis. It was for the latter condition that he was admitted. He gave no history of having swallowed a pin and it was thought that possibly the patient had an intrathoracic aneurysm which was oozing into the esophagus. He was treated for this condition, but died after repeated attacks of hematemesis. At the necropsy it was found that an ordinary pin, slightly bent, had lodged head-first in a small diverticulum above the right bronchus, and that its point had, by continual scratching, penetrated the esophagus and the thoracic aorta. The aorta and esophagus were adherent and the tissues between were infiltrated with blood nearly as far down as the diaphragm. The stomach contained a pint of blood and the whole intestinal canal was filled with blood.

Rudolph Matas¹ details a new and original operation for the **radical cure of aneurysm based upon arteriorrhaphy**. In this operation the sac, as a rule, is not extirpated or disturbed, except to the extent requisite to permit of evacuation of its contents and free exposure of its interior. The operation is applicable to all aneurysms in which there is a distinct sac, and in which the cardiac end of the main artery can be provisionally controlled. It is especially applicable to all forms of peripheral aneurysm of the larger arterial trunks. It is particularly indicated in the treatment of traumatic aneurysms in which the wounded artery communicates with a well-developed and circumscribed sac, and in all fusiform and sacculated aneurysms, whether traumatic or idiopathic, in which the conditions for securing provisional hemostasis can be obtained. The method is not applicable to the treatment of arteriovenous aneurysms, or to recent circumscribed or diffuse pulsating hematomas. The main principle which underlies the operation devised by the author is the fact that the lining membrane of the aneurysm is the same as that of the artery, namely, a serous membrane possessing the adhesive qualities pertaining to this tissue in other parts of the body. In the fusiform or saccular aneurysm caused by direct injury to the artery the sac is in its major part an adventitious product of new-formation, in which, however, the newly formed elements resulting from the connective-tissue proliferation have assumed the fibrous and endothelial characteristics of the adventitia and intima of the parent artery. It therefore follows that, whether the sac be of purely traumatic or of pathologic origin, it can be regarded for surgical purposes as a prolongation or expansion of the affected vessel, and, as such, it is amenable to the same pathologic reactions which characterize the normal bloodvessels when subjected to irritation. In the larger and older aneurysms this sac loses in places its serous surface, but these areas are usually in the distant and peripheral parts which are not in contact with the blood-current, and which are covered and altered by fibrinous deposit. The lining membrane of an artery manifests the reactionary tendencies displayed by serosa when subjected to irritation.

This conception of the sac is the basis of the method here described and successfully utilized by the author in securing the obliteration of the aneurysmal pouch and its orifices by suture.

¹ Ann. of Surg., Feb., 1903.

The first step of the operation as applied to peripheral aneurysms of the larger arteries is prophylactic hemostases. This is accomplished by elevation of the limb and application of the Esmarch' constrictor or the exposure of the main trunk and its compression with a traction loop held by an assistant. After the absolute control of the circulation, the sac is exposed by a free incision, but it is not disturbed from its position. A longitudinal incision is then made from one pole of the tumor to the other. The edges are retracted, the clot is removed, and the interior of the cavity thoroughly exposed. If it is a fusiform aneurysm, two large openings will be seen, usually at the bottom of the sac, separated by an intervening space of variable length, frequently marked by a shallow groove which represents the continuation of the floor of the parent artery. If the aneurysm is of the sacciform type, there will be a single opening of variable size, circular or ovoidal in shape, which connects the sac with the main artery. Differentiation of the sac into these two fundamental varieties is most important in its bearing upon the further aims of the technic. In spontaneous aneurysm of the fusiform type the artery blends so completely with the sac walls that its continuity cannot usually be restored, at least in the present state of our experience. In these cases the object of the suture is simply to close the openings leading to the artery for the purpose of hemostasis and obliteration of the sac. In the sacciform aneurysms, with a single opening leading to the main vessel, it is often quite possible to close the opening without encroaching upon the lumen of the parent vessel, thus maintaining the functional as well as anatomic continuity of the artery. After identifying the main openings into the sac a careful search should be made to discover the opening of any collaterals which if not carefully sutured would give rise to most troublesome hemorrhage. When the hemostasis is complete, the interior of the sac should be gently but thoroughly scrubbed with gauze soaked in sterile saline solution, with the view to clearing it of adherent laminated blood-clots, which interfere with the healing of the sutured surfaces. This toilet of the sac also improves the circulation of the intima and prepares it for more prompt plastic reaction when the surfaces of the sac are brought in apposition. Comparatively few sutures are required to approximate the margins of the parent vessel, as they are usually comparatively thick. The suture material may be silk, chromicized catgut, or finest kangaroo tendon. The full curved round intestinal needles are well adapted for this work. Suturing wounds of arteries differs from this work in that the margins of the aneurysmal sac are much thicker and more easily approximated. The method of applying the sutures is well shown in the accompanying illustrations (Plate 2). This technic also applies to the obliteration of a sacciform aneurysm in which the suture is reconstructive, preserving the lumen of the parent artery. This type of sac is most favorable for the display of the conservative value of arteriorrhaphy from every point of view. The intrasaccular suture of the orifice not only permits of the radical cure of the aneurysm by closing its nutrient orifice, but also favors the restoration of the affected artery to its functional and anatomic integrity. The suture is here not only

EXPLANATION OF PLATE 2.

A, The orifices in the aneurysmal sac in process of obliteration by suture. The first plane of sutures may be made with fine silk, but chromicized catgut is preferred. The sutures are applied very much like Lambert's sutures in intestinal work; the first plane of sutures should be sufficient to secure complete hemostasis. The orifice of the collateral vessel on the left upper side of the sac is shown closed by three continuous sutures.

B, A second row of sutures,—a technical detail of the operation which is advantageous, but not necessary in every case. The first row of sutures has been completed and the arterial orifices have been obliterated. As the walls of the sac are usually relaxed, it is easy to insert a second series of sutures which add security to the first row, and, in addition, reduce the size of the cavity which is to be obliterated by inversion of the skin and surplus sac walls at a later stage in the operation. This second row of sutures is applied as in the first series, by either the continuous or interrupted method, with a curved needle, and Nos. 1, 2, or 3 chromic catgut. A large surface of the sac is thus brought in apposition, and the best opportunity given for adhesion by plastic or exudative endarteritis. If the floor of the sac is rigid or too adherent to the underlying parts, this second row may be omitted, and the operation can be advanced to the last step,—i. e., obliteration of the sac after suture of the orifices.

C, The deep supporting sutures in position and the details of transfixion of the flaps. The Reverdin needle is used to carry the free ends of the threads through the flaps formed by the skin and aneurysmal walls.

D, The sac opened. The dotted lines indicate the position and relations of the main artery to the sac and to the orifice of communication. The object of the operation in this case is to close the orifice of communication without obliterating the main artery.

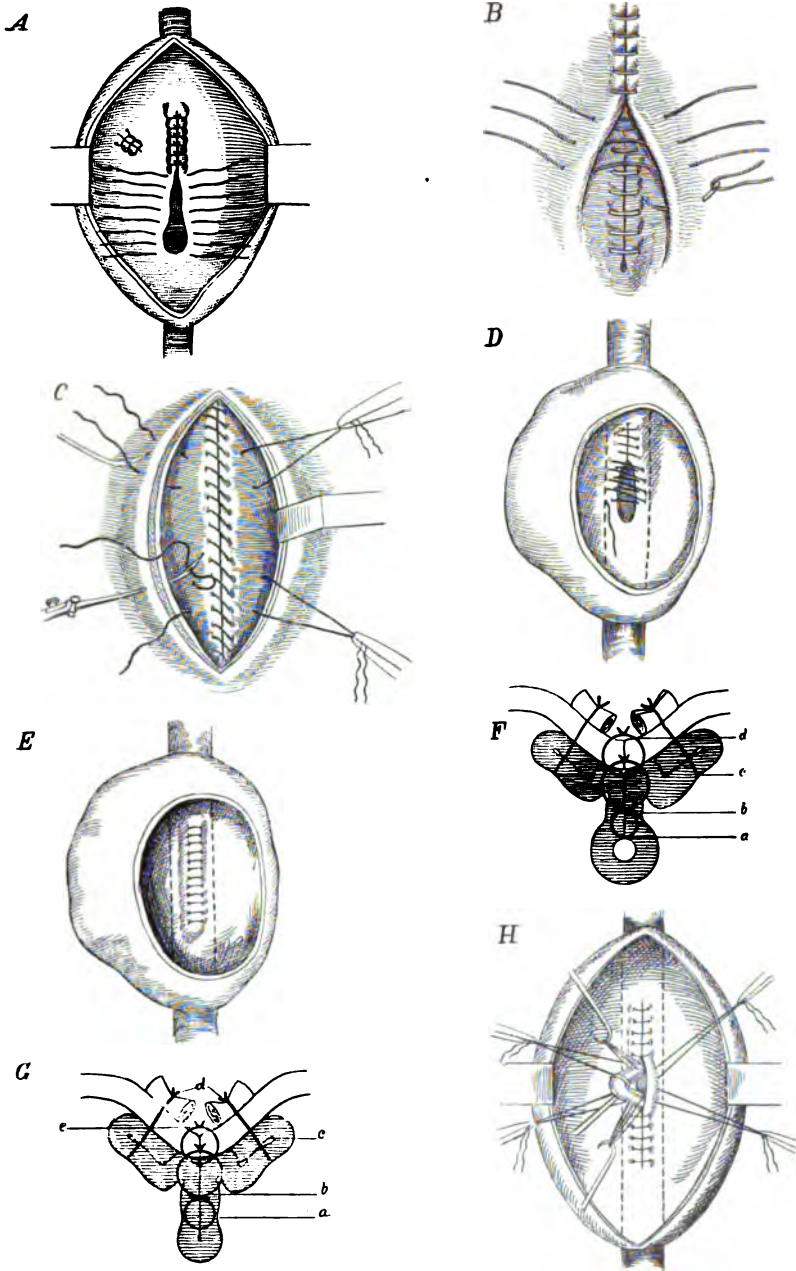
E, The obliteration of the orifice of communication completed. The appearance following the application of interrupted suture is shown. If the suture has been properly applied, the hemostasis will be complete, and the circulation of the main artery restored. After this has been done, the second protective row of sutures shown in *B* and other details of the technic of the obliteration of the sac should be carried out precisely as in dealing with aneurysms of the fusiform type. Anomalous orifices or collaterals opening into the sac, in addition to the main orifices, are less liable to exist in the saciform aneurysms than in the fusiform aneurysms, in which a large area of the arterial wall is involved. In any event, however, should such additional orifices exist, they should be individually closed by a few continued sutures, as shown in *A*.

F, Sectional view of the obliterated aneurysmal sac when the lumen of the parent artery is preserved and the vessel originally communicates with the aneurysm by a single orifice: *a*, First line of sutures which close the orifice of communication and restore the lumen of the parent vessel; *b*, second row of protecting sutures which also reduce the size of the sac; *c*, supporting through-and-through sutures, which bring the roof and floor of the aneurysm in contact; *d*, sutures which hold the skin flap and sac in contact with the bottom of the cavity.

G, Method of obliterating the aneurysmal sac in the fusiform type of aneurysms with two openings. In this class of cases the tunics of the parent artery blend with the sac and the arterial channel cannot usually be restored. The diagram shows the first row of suture (*a*), which obliterates the orifice of the artery at the bottom of the sac. The second row of sutures is shown higher up (*b*), and also the effect of this row in reducing the capacity of the sac. The obliteration of the remaining part of the cavity by the folding in or inversion of the sac walls, with the attached overlying skin is shown in *c*. The function of the deep sutures (*d*) tied over gauze pads, and of the more superficial skin sutures (*e*) in obtaining firm contact of the opposed surfaces, is also shown. This drawing is purely schematic; it gives an exaggerated idea of the size of the sac walls, and is chiefly intended to give an idea of the position of the sutures and other parts.

H, The sutures are nearly all tied, and the new channel is completed except in the center. The two middle sutures are hooked and pulled out of the way while still in position, and the catheter is withdrawn. The obliteration of the sac and final steps of the operation are carried out precisely as previously described.

PLATE 2.



The radical cure of aneurysm based upon arteriorrhaphy (Rudolph Matas, in Ann. of Surg., Feb., 1903).

occlusive but reconstructive. The main point to bear in mind is that in introducing the sutures, these should be inserted at a sufficient distance from the usually thick and smooth margins of the opening in order to secure a firm and deep hold of the fibrous basal membrane. The needle should be made to appear just within the lower edge of the margin, care being taken that when the sutures are tightened the caliber of the artery will not be encroached upon so as to obstruct its lumen, and that the threads will not be brought in contact with the blood in the lumen of the artery. Greater care must be exercised in securing accurate coaptation in this class of cases than in the fusiform type previously described. The larger the caliber of the parent vessel, the more favorable will the conditions be for the restoration of the lumen of the artery and for the functional success of the operation. After obliterating the openings or reconstructing the vessels, as the case may be, the constriction of the main artery should be removed in order to test the suturing. Any capillary oozing will be usually stopped by pressure or by the means subsequently adopted to obliterate the cavity. Obliteration of the aneurysmal sac is accomplished by reinforcing the closure of the vessels with a continuous or interrupted suture extending longitudinally in the floor of the sac and by infolding the skin-flaps as shown in the accompanying illustrations (Plate 2). When the operation is completed, the aneurysmal cavity has been obliterated without in the least disturbing the sac or interfering with its vascular relations. The collateral circulation, which is usually important in the vicinity of the aneurysm, is also respected, and in this way the best conditions for the maintenance of the healthy nutrition in the sac and in the parts beyond the aneurysm are assured. No drainage is employed and the parts should be dressed upon a splint. This method of treating aneurysms is also applicable to the intraperitoneal varieties. The peritoneum is not to be separated by dissection, but is allowed to remain adherent to the sac, and is utilized in place of the skin-flap with even greater ease and certainty of successful union than when the skin is used. Matas also suggests a method of reconstructing the main vessel in fusiform aneurysms by utilizing a portion of the aneurysmal sac and suturing it over a catheter, which is withdrawn before the last sutures are tied.

Matas has employed the method here described in 4 cases; two of direct traumatic aneurysm of the brachial, caused by gunshot-wounds; one femoral and one popliteal, both of the so-called spontaneous variety. (For detailed accounts of these four operations, see "Transactions of the American Surgical Association," volume xx, 1902.) [This method of curing aneurysms certainly deserves a trial at the hands of surgeons, as it is based on good surgical principles and has been most carefully and thoughtfully prepared. The success will depend greatly on a close adherence to the author's technic.]

An interesting case of aneurysm involving the innominate, the right subclavian, and the right common carotid arteries is reported by Ballance.¹ The patient was a marine, 35 years old. The aneurysm

¹ Lancet, Nov. 1, 1902.

was a large one. The symptoms began 18 months before admission to the hospital; there was no clear history of syphilis. A modified Valsalvan treatment, consisting in absolute rest, reduction of food and drink, and large dose of potassium iodid, was instituted. Under this treatment, however, the aneurysm slowly increased in size. Proximal ligation of the innominate close to the aorta was then determined upon. When the aneurysm was exposed it was found to extend to within a half-inch of the aorta. This proximal portion of the artery seemed healthy and was not dilated. In order to have free access to the vessel, the manubrium was split and retracted. This step in the operation, however, Ballance believes was unnecessary, and he does not recommend it. The vessel was ligated with 4 ligatures of gold-beaters' skin, size No. 4. Pulsation in the aneurysm immediately ceased. The common carotid was then exposed above the aneurysm, and 2 strands of the same ligature material were passed around it and tied. It was obvious, however, at this time that the carotid was distended with a clot and that its ligation was really needless. When the patient left the operating room there was no right radial pulse; the right half of the face was colder than the left, and the left half was sweating. On the afternoon of the following day left hemiplegia developed, and the patient died in the evening. At the necropsy the right common carotid, the right internal carotid, and the right middle cerebral arteries were found distended with clot. The other vessels at the base of the brain were collapsed and contained no clot. The entire innominate artery, except the lower half-inch, was found involved in the aneurysm. The first and second parts of the right subclavian and the lower portion of the common carotid were also involved in the aneurysmal tumor. The ligatures were found holding the vessel-walls in contact, but the coats had not been ruptured. In Ballance's article a number of cuts representing the aneurysm and also 2 cross-sections of the anatomy of the parts are shown. Reference is made to the published cases of ligation of the innominate, and the various authorities are quoted. Before attempting ligation of this vessel the surgeon should have well fixed in his mind the anatomy of the parts. The gold-beaters' skin ligature made from the peritoneum of the ox is strongly recommended. Three pounds of pressure are required to occlude the innominate artery and 10 pounds to rupture it. The "stay-knot" is the one of choice in the ligation of large vessels. Two ligatures should be placed about the vessel and a single knot made in each; these knots are tightened at the same time by pulling on the ligatures. The two ends of each side are then tied in a second knot as one ligature. Regarding the cause of death in the case reported, Ballance does not think it directly due to the operation, but believes that the preceding Valsalvan treatment, which reduced the patient's resisting power, had much to do with it. The adoption of the plan of Valsalva in an operable case of aneurysm is regarded as an error.

Jacobsthal¹ presents a critical review of the **treatment of aneurysm of the innominate artery** and reports a case in which Braum ligated the

¹ Zent. f. Chir., Aug. 23, 1902.

right subclavian and carotid arteries. No improvement followed the operation; the patient died 51 days later. After investigating the results obtained by distal ligation and comparing them with those secured by other forms of treatment, it is shown that this operation is not productive of results which warrant its performance. The immediate mortality is 55.7 %. In Poivet's collection of 94 cases the cures were put down at 7.4 %. Jacobsthal has collected 28 more recent cases in which there were no cures, though improvement was found 13 times. [Two years ago one of us (DaCosta) showed a man to the Philadelphia Academy of Surgery who had suffered from an aneurysm of the innominate and also an aneurysm of the right common carotid near its origin. A ligature was placed upon the carotid between the innominate vessel and the carotid aneurysm, and another ligature was placed about the third part of the right subclavian. This man was apparently cured. In spite of advice he returned to his work (he was a blacksmith). One year later he returned to the Jefferson Hospital. The innominate region was apparently sound, but an aneurysm had developed upon the common carotid at the seat of ligation. No further operation was performed and the patient has been lost sight of.]

Stonham¹ reports a very interesting case of **aneurysm of the second and third portions of the subclavian artery** which was first treated by ligation of the first part of the subclavian. This, however, was followed in a short time by a recurrence of pulsation in the tumor, and a second operation was performed which consisted in the ligation of the inferior thyroid, vertebral, and third portion of the axillary arteries. The patient was a syphilitic 43 years old. At the primary operation the subclavian was ligated after a subperiosteal resection of the clavicle. After the second operation the patient recovered without any permanent interference with the circulation of the arm. Stonham examined this man about two years after the operation and found him perfectly well, with a complete disappearance of the aneurysmal sac. [Nassau, of St. Joseph's Hospital, Philadelphia, recently successfully ligated the first portion of the right subclavian for traumatic aneurysm.]

Martin² reports the interesting case of a British soldier who received a gunshot injury in the left groin and as a result developed a **large traumatic aneurysm** involving the external iliac artery so high up as to render the **ligation of the common iliac** the only available treatment. This was done and the patient recovered and retained perfect use of the leg. For some time after the operation he complained of anesthesia in the leg and inability to move it, but these annoyances gradually disappeared.

Rankin³ reported before the Royal Medical and Chirurgical Society 4 cases of **aneurysm treated by the subcutaneous injection of gelatin**. The solution employed consisted of 1 ounce of gelatin, 131 grains of sodium chlorid, and 50 ounces of sterile water. The inner aspect of the thigh was the point chosen for the injection. Each of the four cases

¹ Lancet, Aug. 2, 1902.

² Brit. Med. Jour., Jan. 10, 1903.

³ Lancet, June 27, 1903.

showed marked improvement. Three were thoracic and one was an abdominal aneurysm. The following conclusions are reached regarding the treatment: "(1) That gelatin injections, given with proper precautions, are safe. (2) That they produce alleviation of all the subjective and many of the objective symptoms. (3) That the relief of symptoms is probably to be explained by shrinkage of the aneurysmal sac and consequent diminution of pressure on surrounding parts. (4) That such diminution can be demonstrated in 3 out of the 4 cases treated. (5) That the after-histories afford evidence of the permanent nature of the beneficial results of the treatment." [We have never obtained benefit in aneurysm by injections of gelatin. The commercial material is difficult to sterilize, and sometimes contains the spores of tetanus bacilli, and we regard its injection as hazardous. It should only be given when there seems to be no other plan of treatment which offers any reasonable chance of success.]

A. H. Ferguson¹ reports a case of **end-to-end anastomosis of the popliteal artery for gunshot injury**. The patient was a man, 38 years of age, who received a gunshot wound of both thighs. On the right side there were all the evidences of a ruptured popliteal artery. Among these evidences were a diffuse pulsation in the popliteal space which could be seen and felt, and a systolic bruit which could be heard behind the knee. A tourniquet was applied to the thigh, and the popliteal space was exposed by a free incision. The artery was completely severed except for a few shreds of the outer coat at the conjunction of its middle and upper thirds. The bullet was found immediately behind the injured artery. Strips of gauze were tied around the vessel, one being placed above and one below the injury. The tourniquet was then removed. About one inch of the lacerated ends were resected, and an anastomosis by invagination was performed. When the suturing was completed and the gauze strips were removed from the vessels, the blood flowed readily into the limb, pulsation at the ankle was at once restored, and the extreme pallor of the foot disappeared. A flap about an inch wide was taken from the semimembranosus muscle and lapped around the artery at the side of the union. A day after the operation sensation had returned to the toes and foot and the skin was nearly normal in color and felt warm. The patient did well until 41 hours after the operation, when he complained of a sudden severe shooting pain in the calf. The foot became rapidly engorged with venous blood, and sensation in it was lost. Pulsation of the anterior tibial artery had also suddenly ceased. Following this sudden onset of symptoms there developed dry gangrene of the toes and a portion of the foot, which later necessitated two partial amputations of the foot. The patient ultimately recovered. Four months after the operation the patient complained of inability to straighten his leg owing to the tension produced by the cord-like scar in the popliteal space. Ferguson excised this, and in doing so examined thoroughly the artery. He could see and feel free pulsation above and below as well as at the seat of the anastomosis.

¹ Ann. of Surg., May, 1903.

Alexander Lambert and W. B. Coley¹ detail a case of **embolism of the mesenteric artery** occurring in a young man 34 years of age of decided alcoholic habit. The patient was very fat. The symptoms came on suddenly during the night, the patient being awakened by severe pain in the abdomen. There was no vomiting or nausea at this time. The following evening the abdomen was markedly distended, generally tympanitic, and moderately tender throughout. He gave a history of having had recurring attacks of appendicitis five years previous. During his present attack there was no tenderness in the right iliac fossa. Attempts to move the bowels were unsatisfactory. The next day the patient began to vomit. In the evening the vomiting became stercoraceous, and it was evident that there was absolute obstruction of the bowels. When the abdomen was opened, some dark fluid escaped and considerable matting together of the omentum by recent adhesions was noted. The omentum also presented numerous small embolic infarctions. Several feet of the small intestine were greatly thickened and dark. In the absence of other cause it was determined that the obstruction was produced by a thrombosis of the mesenteric vessels. The general distention of the bowels was so great that the exact point of embolism could not be determined. The abdomen was drained and closed. The patient died 7 hours after the operation. At the postmortem examination the mesenteric vessels were found thrombosed and there were also multiple pulmonary infarctions. There was general atheroma of the vessels and extreme fatty degeneration of all visceral parenchyma, notably of the heart-muscle. These changes were probably due to alcoholic toxemia. Embolism of the mesenteric artery occurs in the majority of instances in patients beyond middle life, and many of the victims suffer from coexisting diseases, most often cardiac or renal, with atheromatous arteries; a minority, however, are younger than 40 years with no serious disease in other organs, and in such case the cause of the embolism is not discoverable. While the variability in individual symptoms is noticeable, there seem to be two main types of the clinical picture. The less common is sudden, violent, colicky pain, not localized, with obstipation and vomiting which later become fecal. The more common type is sudden, intense colicky pain, not localized, with or without distended abdomen and a diarrhea often bloody, with blood often in the vomitus, a subnormal temperature, and great prostration. A few cases of recovery from occlusion of the mesenteric arteries have been reported, as branches of these arteries have been found occluded with long-standing fibrous plugs.

Eugene Fuller² describes the **control of hemophilia by the administration of thyroid extract**. He also points out the effect of thyroid in another form of hemorrhage. The use of this drug in hemophilia was the result of an experiment after other means had failed. The first patient in whom it was employed was a Hebrew boy 15 years of age. He presented the following interesting family history: Four of his maternal uncles had bled to death following circumcision performed as a religious rite. Two of the patient's elder brothers had bled to death from the same

¹ Med. News, Sept. 6, 1902.

² Med. News, Feb. 28, 1903.

cause. The patient was never circumcised, but since early life had had copious nose-bleeds and severe hemorrhage following the shedding of his first teeth. His joints had swollen repeatedly, and as the result of the slightest bruising extensive subcutaneous hemorrhages developed. For a year the patient had been in a very weakened condition through spontaneous attacks of hematuria. His pulse was 130 and very weak when Fuller first saw him and he was extremely cachectic and short of breath. The usual remedies had no effect, and after they had failed he was put upon 5 grains of thyroid extract 3 times a day. After the second dose had been administered the bleeding ceased, and at the time of the report it was 9 months since the treatment was begun and the boy had given not the slightest evidence of hemophilia. In these 9 months the patient had grown a great deal and was markedly better in every respect. In a case of hematuria due to congestion of the prostate Fuller has also used thyroid extract with wonderful result. The remedy was not employed here until after perineal drainage had been unsuccessfully employed.

Crile¹ presents a research into the **means of controlling the blood-pressure**, illustrated by numerous charts. The following is a summary of the article: "In many instances the control of the blood-pressure is synonymous with the control of life itself. Surgical shock is an exhaustion of the vasomotor center. Neither the heart-muscle, nor the cardio-inhibitory center, nor the cardioaccelerator center, nor the respiratory center, are other than secondarily involved. Collapse is due to a suspension of the function of the cardiac or of the vasomotor mechanism. In shock therapeutic doses of strychnin are inert, physiologic doses are dangerous or fatal. If not fatal, increased exhaustion follows. There is no practical distinction to be made between external stimulation of this center, as in injuries and operation, and internal stimulation by vasomotor stimulants, as by strychnin. Each in sufficient amount produces shock, and each, with equal logic, might be used to treat the shock produced by the other. Stimulants of the vasomotor center are contraindicated. In shock cardiac stimulants have but a limited range of possible usefulness, and may be injurious. In collapse stimulants may be useful because the centers are not exhausted. Saline infusion in shock has a limited range of usefulness. In collapse it may be effective. The blood tolerates but a limited dilution with saline solution. Elimination takes place through the channels of absorption. Its accumulation in the splanchnic area may be sufficient to fix the diaphragm and the movable ribs, causing death by respiratory failure. Saline infusion in shock raises but cannot sustain the blood-pressure. Adrenalin acts upon the heart and bloodvessels. It raises the blood-pressure in the normal animal; in every degree of shock; when the medulla is cocainized, and in the decapitated animal. It is rapidly oxidized by the solid tissue and by the blood. Its effects are fleeting; it should be given continuously. By this means the circulation of the decapitated dog was maintained 10½ hours. In excessive dosage there is a marked stimulation of the vagal mechanism. Due caution must be exercised. The pneumatic rubber suit provides an

¹ Boston M. and S. Jour., March 5, 1903.

artificial peripheral resistance without injurious side effects, and gives a control over the blood-pressure within a range of from 25 to 60 mm. mercury. By the combined use of artificial respiration, rhythmic pressure upon the thorax and adrenalin injected into the jugular vein, animals which were apparently dead as long as 15 minutes were resuscitated."

Sir William H. Bennett,¹ in an instructive address, deals with **varicose veins of the lower limbs**. Varicose veins are divided into 3 classes: congenital, acquired, and intermediate. The latter is congenital in origin, but influenced in its increase by the same causes which give rise to the acquired variety. The large majority of cases belong to the first class. Such veins are usually discovered accidentally about puberty. True cystic, that is circumscribed, dilations of considerable size are not common in the congenital varix unless a rapid increase has been caused by injury or strain. True cystic dilation should not be confused with the appearance of a cyst caused by the bends and twistings in the course of a varicose vein. In some of the most exaggerated cases of congenital varix the increase in size affects the main arteries as well as the veins, and it is this which explains the fact that some of the most severe and dangerous cases give rise to no discomfort of any kind under ordinary circumstances. As to the second variety, that of acquired varix, Bennett states that it is doubtful whether a really normal vein can be made varicose by any ordinary strain which may be thrown upon it after adult life has been fully reached. The intermediate varix results from injury or strain of the congenital variety, and it is this type which is the most productive of symptoms. Aside from the isolated areas of varix in the different parts of the limbs, the distribution of varix may be primarily arranged over three main areas; along the line of the internal saphena vein, along the line of the external saphena vein, and along the outer side and back of the thigh. The external varicose vessels which may or may not be associated with varix in the corresponding labium may invariably be taken to be due to pelvic causes, and are seldom seen in women who have not borne children. It is this variety which is likely to give rise to great trouble during pregnancy and labor. Varix of the saphenal area is of comparatively small moment in pregnancy and labor. Among the troubles arising from uncomplicated varix and their causes are pain, fulness without edema with a feeling of weight and tension in the limbs, and edema. Any one of these may exist alone, or be associated with the others. It must be realized, however, that the mere existence of a varix itself does not necessarily entail discomfort or any other disability. Congenital varix, which is also generally hereditary, rarely gives rise to any symptoms at all in the absence of direct injury, great strain, or other conditions which may produce trouble in any ordinary vein. If the main arteries of the limb participate in the exaggeration in size, the liability of trouble arising from a congenital varix is less than when the alteration affects the veins alone. On the other hand, the acquired varix nearly always in due time produces symptoms of varying degrees of importance. The primary change in

¹ Lancet, Nov. 22, 1902.

acquired varix is the partial or complete giving way of one or more of the vein valves; the more complete the inadequacy of the valves, the more rapid is the change toward varicosity. Pain is of two kinds—a sharp pain along the line of the veins which comes on soon after rising in the morning and becomes gradually worse during the day; and the pain which is felt generally throughout the limb, dull, heavy in character rather than sharp and acute. It commences in the foot usually and travels up; there is no edema. Tension and weight are generally associated with the steady growth of the congenital cases. There is no actual pain here, but a feeling of weariness. Edema is met in two forms, that in which it commences in the foot and by degrees involves the whole limb, and the other, in which it commences in the thigh along the inner, posterior or outer aspects, and may remain almost entirely limited to the area above the knee. In any case in adults the occurrence of edema indicates derangement of the vascular apparatus to a serious degree, but in growing subjects this is not generally so, unless there is a reckless neglect of all precautions. In growing young people the tendency to edema is usually temporary. Bennett calls especial attention to the fact that although edema and varicosities may be limited to the thigh, the pain is often felt in the leg, and this fact frequently leads to a mistake in diagnosis. Varix rarely becomes obvious before puberty. In congenital cases the appearance of the varix is invariably prior to the occurrence of symptoms arising from it; in the acquired kind, on the other hand, feelings of discomfort, such as pain, weight, and leg weariness, generally precede the manifestation of the altered veins and call attention to them. "Spontaneous increase" is the descriptive term applied to changes which take place in varicose veins without obvious cause. It is likely to show itself at, or soon after, puberty. In beginning the discussion of treatment attention is again directed to the fact that the mere existence of varicose veins does not necessarily call for any treatment. With few exceptions varicose veins which cause no inconvenience or discomfort should be let absolutely alone, treatment often producing symptoms which did not exist before. Exceptions to this rule are the requirements of the public service, the existence of well-defined cysts, or other conditions in localities liable to injury, and the occurrence of isolated and limited masses of congenital varix. The minority of cases of varix can be cured, but the majority cannot. Acquired varix in the early stages in growing subjects is susceptible to cure; so also is the circumscribed congenital variety. All other varieties of varicosity are incurable in the true sense, although the symptoms arising from them can be alleviated or entirely removed. It is a mistake to advise complete rest in cases of increasing uncomplicated varix. The treatment of varicose veins is divided into nonoperative, consisting in hygienic, manual, and mechanical treatment; and operative or radical treatment. Intensely cold baths are not advisable in cases of marked varicosity, Bennett stating that they tend to the production of thrombosis. The treatment described as manual consists in massage. Massage properly applied in early increasing varix in growing patients can do much to check the process.

It requires patience and time. The amount of improvement following this treatment will depend upon the degree of valvular insufficiency which has been reached. The simple rubbing of the varicosed areas with alcohol night and morning is highly recommended, but should never be used if eczema exists. The irrational use of mechanical supports is productive of much harm. The accidental discovery of varicose veins in the limbs is no justification for the employment of a support of any kind. In many such cases the elastic stocking is the sole cause of increase of the pathologic condition and the symptoms accompanying it. A properly applied support at the onset of pain, discomfort, or edema in varix is most useful, and gives relief and comfort in many cases. Such support should only be used, however, when it relieves symptoms and when its application is unaccompanied by coldness of the feet. If relief is not obtained and the feet are cold, it is a sure indication that the support either does not fit, has been improperly applied, or that the method of treatment is not suitable for the case. Great pains should be taken to see that the elastic stockings fit snugly but not too tightly. The unperforated rubber bandage should never be used, and the perforated rubber bandage should always be worn over a thin stocking. In speaking of the operative treatment Bennett says that a most important feature is the keeping of the patient in bed for at least 3 weeks after operation, and that 6 weeks to 2 months should elapse before the patient resumes anything like ordinary active exercise. Localized masses of congenital varicose, cystic dilations and aberrant varicose veins in dangerous places should be dissected out. In all operations for varicose veins a portion of the long saphena vein should be removed. This operation alone, provided there is sufficient rest after it, will result in a general shrinking of all the affected veins below the seat of operation. This can be supplemented also by a removal of 3 inches of the vein below the knee. It is the author's custom always to combine the two operations. When there are well-defined cystic dilations above the inner side of the knee, it is Bennett's practice to remove the whole of the saphena from the thigh. When this is done, the resection of the vein below the knee is unnecessary. Because of the complications liable to result from the varicosities in the external femoral region during pregnancy it is strongly recommended that such veins should be removed.

The operative treatment of varicose veins is dealt with by J. B. Blake.¹ He first sets forth the history of the treatment of this condition. It is shown that before a cure is claimed for any method of treatment one year should elapse from the time of operation, and recurrences have even taken place at a much later period. There are three forms of operative treatment: Ligation in one or more places; excision in short portions, chiefly high up; removal in extenso by continuous dissection; or a combination of the last two methods. Multiple ligation is distinctly less effective than the other methods. Trendelenburg's operation, which has been so extensively employed, consists simply in the ligation of the internal saphenous vein in two places 5 cm. or 6 cm. apart in the upper

¹ Boston M. and S. Jour., Sept. 25, 1902.

third of the thigh, and the removal of the short intervening portion. It is indicated only in those cases where, the limb being raised and made free from blood, the saphenous vein being compressed, and the leg lowered, the blood is seen to rush in a wave down into the empty vein the moment the pressure is removed. This test, which is Trendelenburg's own, is supposed to demonstrate the fact that in such a vein there is a column of blood extending from the right heart to the foot which is unsupported by vein valves, and which is the essential feature in the production, or at least in the continuation, of the symptoms. There has been a great difference of opinion regarding the condition of the deep veins when the superficial ones are varicosed. Gay, Verneuil, and others state that the deep veins and frequently the arteries are also varicosed. Callendar, however, failed to discover evidence in his dissections of the constancy of the intermuscular varix. In the Trendelenburg operation of course the entire circulation is thrown upon the deep veins. This latter is an argument in favor of their not being varicosed, else permanent results could hardly be obtained. Blake points out that the following two points require settlement in the future regarding the operative treatment of varix: "(1) To determine how often the deep veins are actually and clinically affected, in connection with superficial varicosity, and how it is possible to determine the condition of these deep veins before operation. (2) To subject a large number of cases of all degrees of varicosity and its complications to the same method of treatment, and trace the results carefully for one or two years. This method of treatment might be the unmodified Trendelenburg operation, or this operation combined with local dissection."

W. F. Campbell¹ has made a careful study of the **anatomy of the internal saphenous vein** with the idea of determining some satisfactory guide for the ligation of the vein. He recommends the following procedure: "Find the spine of the pubes. From this point project a line $3\frac{1}{4}$ inches long at right angles to Poupart's ligament. The end of this line marks the point for the center of the incision, which should be about one inch long and parallel with the fold of the groin. In retracting the edges of the incision, retract the upper edge so as to ligate as near the saphenous opening as possible."

John G. Clark² discusses **postoperative femoral thrombophlebitis** and presents a careful consideration of a large table of cases. Regarding the theory that femoral thrombosis is secondary to a propagating thrombus of the deep epigastric veins, the following substantiating points are drawn from the cases collected: "(1) It occurs in cases where traumatism due to heavy retraction—as in the delivery and operation upon fibroid tumors, adherent cysts, and cancer of the uterus—may directly injure the epigastric vessels, especially by digging the end of the retractor into the under surface of the abdominal wall at a position where the deep epigastric vessels may directly be injured. (2) A relatively large proportion of cases occurs in the operation for suspension of the uterus where the peritoneum is drawn out and the ligatures passed out laterally

¹ Med. News, Feb. 21, 1903.

² Univ. of Penna. Med. Bull., July, 1902.

in about the position to catch the epigastric vessels or make sufficient traction upon them to induce the formation of a thrombus. (3) The entrance of the epigastric vessels just above Poupart's ligament at right or obtuse angles to the main venous currents, along with the superficial epigastrics immediately below in the femoral, and the circumflex iliac, set up an extensive eddying or whirlpool movement essential to the propagation or formation of a thrombus. (4) The interval of from 8 to 15 days between the time of the operation and the appearance of symptoms of femoral thrombosis is accounted for by the slow growth of the thrombus in the deep epigastric, thus gradually extending until the advancing plug is thrust out into the venous whirlpool beneath Poupart's ligament. (5) The greater frequency of the occurrence of a left rather than a right-sided thrombus is doubtless due to the presence of the mechanical conditions on the left side, which still further slow and derange the femoral and iliac circulation, thus favoring the propagation of the thrombus downward into the femoral vessel. (6) Thrombi quite likely form in the epigastric vein after many abdominal operations, but only in the rare exceptions are they propagated beyond these vessels, hence the infrequency of femoral thrombi as a postoperative sequel. (7) The fact that there are on each side two deep epigastric veins which freely anastomose with one another also explains why the femoral vein is seldom reached by the propagating thrombus, for in the event of a segmental occlusion of one vein, the other, by compensation, may carry a freer blood-current into the iliac vein. (8) Femoral thrombi are slow in formation, and likewise slow in disappearance, for when once formed they tend to perpetuate themselves, and only finally give way by slow liquefaction."

DISEASES OF THE LYMPHATIC SYSTEM AND OF THE THYROID GLAND.

Daniel¹ gives a very interesting report of 4 cases of **sarcoma of the thyroid**. Extirpation was possible in only one of these cases. The ages of the patients varied from 57 to 69 years. In 3 cases the sarcoma was of round or mixed cells; in the fourth the growth was giant-celled. The cases terminated fatally in from 8 to 17 months from the time of the earliest observation of the growth. In each of these cases it is thought that the growth was primarily malignant. The right lobe was the one involved in all. In 3 cases the cervical glands were involved and were palpable; in the fourth case no glands were found. Secondary growths were present in 3; in one the secondary growth involved the dorsal and lumbar vertebrae, both kidneys, both suprarenals, the celiac and cervical lymphatic glands, and the stomach; in another the kidneys, the cervical and thoracic glands were involved; in the third case, in which there was a coexisting myxedema, there were present malignant ulcers of the stomach and intestine, malignant infiltration of the pancreas and involvement of the cervical glands. In but one case was there

¹ Lancet, July 19, 1902.

marked deviation of the trachea. Pain was not a permanent symptom in any of the cases. Dysphagia and dyspnea were present in 3 cases. In 2 there was extensive infiltration into the trachea. Complete fixation of the tumor to the deep structures was found in 3. In 2 of the cases the carotids were embedded in the growth..

An editorial¹ in the Journal of the American Medical Association says: "Albert Kocher² has reported the cases of **Basedow's disease** which have come under the observation of his father, Professor Kocher, in his hospital and private practice between the years 1883 and 1899. The series comprises 93 cases, of which 74 were cases of true exophthalmic goiter. Kocher insists that the operation should not be done when the patient is in the stage of marked cardiac and psychic irritability. Means must be used to reduce these as much as possible first. All the operations were performed under the local use of a 1 % solution of cocaine. Altogether, 59 of the 74 cases of true Basedow's disease were operated on. Four of the 59 patients died with symptoms of tetany within 10 days of the operation. Of the remaining 55 cases, 39, or about three-fourths, had unpleasant postoperative symptoms. These consisted of transitory psychic disturbances, irritability, oppression, palpitation, sensation of heat, congestion of the face, general tremor, sweating, vomiting, fever and irregular, frequent pulse; in fact, temporary increase in the symptoms present before the operation. The fever and tachycardia persisted in all the 39 cases. The other symptoms mentioned occurred in the majority of the patients. The possibility that these symptoms were due to an acute toxemia resulting from absorption of certain substances pressed from the gland during the operation is discussed, but a satisfactory explanation for the aggravation of the symptoms is not arrived at. The other 16 patients operated on had no disagreeable after-effects. The results of the operative treatment are satisfactory. Of the 59 cases operated on, 45, or 76 %, were cured; 8, or 14 %, were decidedly improved; 2, or 3.5 %, were only slightly improved; 4, or 6.7 %, died with symptoms of tetany after the operation. In 15 of the 74 true Basedow cases medicinal treatment of various kinds was used. The results, notwithstanding the fact that several of them were mild cases, are in striking contrast to those obtained from operative procedures. In only one case could a cure be said to have occurred, and this was really brought about by the patient developing an intercurrent disease. Necropsies were obtained in 3 of the 4 fatal operative cases. Several factors may have played a part in causing the fatal termination in the first case. There was a persistent thymus; the heart was dilated and there was a fluid exudate in the serous cavities, and the superior cervical ganglion was very much enlarged. In the second case death was found to be due to double-sided pneumonia and pleurisy. The fatal result in the third case was believed to be due to the extreme severity of the intoxication. At autopsy the dilated heart, spleen tumor, jaundice and fatty degeneration of the liver and spleen confirmed this view."

¹ May 23, 1903.

² Mitteilungen aus den Grenzgebieten der Med. u. Chir., 1902, Bd. ix, 1 u. 2 Heft.

F. C. Madden¹ reports 2 fatal cases of partial thyroidectomy for goiter. The first patient died 24 days after operation during an attack of tetany. At the necropsy no trace of thyroid tissue could be found in the neck, although a small portion had been left at the time of operation. The second patient died 28 hours after operation from thyroid intoxication.

In a clinical lecture on goiter, J. Chalmers DaCosta,² in discussing the operative treatment of exophthalmic goiter, states that operations, whatever their nature, frequently fail to cure Graves's disease. Often an operation will cure the goiter and not the other symptoms. In the average case operation is indicated only when some particular necessity arises. "Further, in reaching a conclusion as to the advisability of operation we should remember that exophthalmic goiter is, in some cases, cured by rest or by the administration of drugs; and that in rare instances it disappears spontaneously after a shock to the nervous system or after an operation upon a distant part of the body performed for some other trouble. Again, operation is more dangerous than in common goiter, and sudden death may occur during its performance or after its completion. For these reasons it is wise, in the majority of cases, to employ medical treatment; but if that fails to cure or to ameliorate, and if the symptoms are urgent, then the advisability of an operation must be considered. Partial thyroidectomy is the operation to be preferred unless the goiter is very small, the nervous symptoms being the predominant factors; or, unless the goiter is very large, in which case the operation is exceedingly dangerous. If the patient is in an extremely hysteric condition, such a severe procedure is inexpedient. As a matter of fact, it has been found that when an exophthalmic goiter is very large, thyroidectomy relieves the patient of the thyroid enlargement, but does not cure the symptoms. If it is quite small, it is evident that thyroidectomy is unnecessary; and if the hysteric element is well marked, the operation is generally perfectly useless. Thyroidectomy is not to be performed simply because a person has an exophthalmic goiter. Bilateral resection of the sympathetic ganglion is a purely experimental operation. Rest in bed, an ice-bag over the thyroid, and suprarenal extract internally is probably the best medical treatment. In cases of parenchymatous goiter, thyroid extract should always be tried. "We are justified in operating if the goiter is rapidly or steadily increasing in size, or if it is producing dyspnea, marked discomfort, or annoying deformity. If it is producing marked pressure, operation is imperatively necessary." Tapping is uncertain and unsafe. Injections are more dangerous and less satisfactory than radical operation. Ligation of the thyroid arteries is practically restricted to the treatment of exophthalmic goiter. "Occasionally, when the patient is in a desperate condition, when the goiter is very large, when we are certain that a radical operation would be productive of death, and when a tracheotomy is impossible, the operation known as exothyropexy may be performed. In order to perform this operation make a large incision, exposing the capsule of the gland, pull the goiter

¹ Lancet, June 20, 1903.

² Am. Jour. Med. Sci., July, 1902.

itself—or, at least, a part of it—out of the wound, and leave it exposed to the air. This dislocation of the goiter relieves the dyspnea, and may be followed by atrophy of the gland. Some surgeons have advised a simple division of the thyroid isthmus—an operation which may relieve the dyspnea and may produce glandular atrophy; but it is uncertain and often of no avail. The two operations most in vogue are enucleation and extirpation. Enucleation is an operation frequently practised in cystic goiter and in adenomatous goiter.”

H. S. Barwell¹ reports a **case of goiter in an abnormal thyroid gland**. The tumor was on the left side of the neck. On its inner side it was completely separated from the thyroid gland by two layers of fascia which formed the capsules of the gland and the tumor respectively, and between the two ran the sternothyroid muscle. Attached to the back of the right lobe of the thyroid gland was a process which passed vertically downward into the thorax for more than an inch. The case was a dissecting-room subject. The tumor was developed, not from an accessory thyroid, but from the left lobe of the gland congenitally ununited with the rest of the thyroid. “The thyroid gland is developed from a median process of the pharyngeal hypoblast, which bifurcates below and forms the pyramidal lobe, isthmus, and part of each lateral lobe; the main part of each lateral lobe is formed by a lateral outgrowth from the pharynx. In man they are found to be fused together in an embryo of 13.8 mm. in length, or about the seventh week. In most vertebrates they remain distinct; only in mammals do they become united into one organ. In rare cases in man the isthmus is entirely absent and the two lateral lobes quite separate. In many vertebrates, however, the median thyroid rudiment divides to form two distinct lateral glands, but in this case the median lobe appears to be well developed and undivided.”

J. T. Hewetson² reports a **case of congenital goiter** which ended fatally 5 minutes after birth.

Leonard Freeman³ summarizes a paper on the **treatment of tuberculous glands of the neck** as follows: “(1) The gravity of tuberculosis of the cervical lymphatics, both as regards local deformity and remote secondary manifestations, is generally underestimated. (2) General treatment, especially hygiene, is of the utmost importance, both in the cure of incipient trouble and in the prevention of relapses following operations on more advanced cases, most recurrences being due to neglect of such measures. (3) Residence at the seashore has long been recognized as of great benefit; but there is reason to believe that a high and dry climate, such as that of Colorado, with its rarefied, stimulating atmosphere and abundant sunshine, possesses superior advantages. (4) A point of extreme importance in local treatment is to abolish sources of infection, in the teeth, tonsils, nose, ear, scalp, etc., and neglect of this is apt to result in failure. (5) Nonoperative treatment is often of doubtful utility, except in the beginning of the disease. (6) Pulmonary involvement does not contraindicate operation, at least in Colorado, except in

¹ Lancet, April 11, 1903.

² Brit. Med. Jour., March 21, 1903.

³ Jour. Am. Med. Assoc., Dec. 6, 1902.

advanced cases. (7) Curetment is applicable to sinuses, tubercular ulcers of the skin, and where complete removal would be attended by too much risk. In all other instances a thorough operation should be done. (8) The size and shape of the incision should be adapted to the particular case. It should be free enough to permit of thoroughness and safety. (9) The chance of permanent cure following operation is probably better in Colorado than in lower and less favorable altitudes."

James F. Mitchell¹ draws the following conclusions from a study of **the treatment of tuberculous cervical adenitis**: "(1) Tuberculous cervical adenitis is primarily a local disease of very frequent occurrence, more often in young persons; in itself not extremely serious and rarely if ever proving fatal. (2) It bears, however, a certain definite relation to tuberculosis of the lungs and serves as the starting-point from which tuberculosis may spread. (3) The tuberculin test as an aid to diagnosis is positive and harmless. (4) While recovery may often take place under good hygienic conditions, surgical interference is clearly demanded in most cases. (5) When surgical treatment is resorted to, the operation should be radical in all cases. (6) Recovery may be predicted in 70 % to 80 % of cases so treated. Tuberculosis of the lungs after complete removal of the glands is comparatively rare. (7) Tuberculosis of the lungs unless far advanced is not a contraindication to operation, the removal of the glands apparently exerting a beneficial influence on the condition of the lungs."

DISEASES AND FRACTURES OF BONES.

David Officier² reports 2 cases of **fragilitas ossium**, occurring in one family. The first patient, a female aged 12 years, had suffered from more than 40 fractures of the extremities. The second patient, a male aged 7 years, had had more than 20 fractures. These fractures were all produced by very slight violence, were sometimes very painful, and at other times almost painless. The fractures usually united well in a short time, probably because of the very slight violence which would in such a very brittle bone almost necessarily produce transverse lesions. There are 5 other children in the family who are healthy, and no trace of the disease can be found in the ancestors. In neither of the cases did a fracture of the ribs take place.

A. W. Morton³ reports a case in which he used a **new method of bone-grafting**. The patient, a male aged 45, sustained a compound fracture of the leg which resulted in the loss of the lower 5 inches of the tibia from necrosis. After the removal of the sequestrum a dog was etherized and its foreleg amputated just above the tarsus, the ulna being left one inch longer than the radius. The skin and muscles of the dog's leg were divided by a longitudinal incision for 4 inches and left attached except the lower 3 inches, which were separated from the periosteum.

¹ Johns Hopkins Hosp. Bull., July, 1902.

² Intercol. Med. Jour. of Australasia, Oct. 20, 1902.

³ Amer. Med., July 12, 1902.

The end of the ulna was implanted in the medullary cavity of the tibia and there fastened by silver wire; the radius was wired to the end of the tibia. Both the man's leg and the dog were encased in plaster-of-paris. Five weeks later the skin and muscles were separated from the dog's leg and the two bones divided near the joint and placed in contact with the astragalus.

A. H. Andrews¹ describes a new method for diagnosing fractures. "The test is made by placing the stethoscope in close proximity to the bone near one end, and the handle of a vibrating tuning-fork as close to the bone as possible beyond the supposed seat of fracture. The sound will be transmitted through the shaft of the bone to the stethoscope and through the stethoscope to the ears of the examiner. When the bone is intact, if the test is properly made, the sound of the fork will be heard with great distinctness, but if there is a solution of continuity the sound will either not be heard at all or will be heard very faintly. By comparing the intensity of the sound on the suspected side with the sound heard under similar conditions on the normal side, the question of continuity of bone can be determined."

Hugh Crouse² describes his method of **windowing plaster casts in compound fractures**. The method is aseptic, permits of frequent inspection, and allows copious flushing. "Dental rubber, known as No. 2, is dissolved in commercial chloroform, sufficient of the latter being used to form a semi-gelatinous paste; absorbent wool is worked into this until a meshed mass results. Taking strands of the rubber-laden wool—the plaster cast having been windowed sufficiently to give an inch of healthy uninjured tissue around the entire circumference of the wound, the skin having been previously shaved, sterilized, and well dried—layer after layer is rapidly packed by the aid of a dural elevator between the cast and skin until at every point a snug filling exists. Then, by using a plain chloroform solution of the rubber, the entire area is rapidly veneered until a smooth rubber mass, extending from near the wound margin well out on to the cast, exists. The cast is then shellacked."

Joseph C. Bloodgood³ reports a case of **medullary giant-cell sarcoma of the upper end of the tibia**, in which the tumor was apparently removed by chiseling without destroying the continuity of the bone, and details 6 other similar cases occurring in the Johns Hopkins Hospital. He thinks that if it be impossible to remove the growth by chiseling or curetting, the tumor should be dealt with by resection provided the amount retained is sufficient to permit of good function in spite of a limp. Amputation is indicated only when the disease has destroyed so much bone, or infiltrated the soft parts to such an extent, that resection is either impossible, or, if possible, the extent of the necessary operation would leave a practically useless extremity. If the attempt at removal of the disease is followed by local recurrence, the possibility of internal metastases is apparently not increased.

¹ Chicago Med. Recorder, March 15, 1903.

² Virginia Med. Semi-monthly, June 12, 1903.

³ Johns Hopkins Bull., May, 1903.

Lindsay Peters¹ reports a case of **fracture of the ischiopubic ramus and rupture of the bladder** in which recovery followed suture of the bladder and drainage.

J. E. Power² reports a case of **arsenical necrosis of the lower jaw** resulting from the use of colored yarn as a tooth-cleanser.

F. C. Larkin³ points out that **cerebrospinal rhinorrhea** may exist some time after a **fracture of the skull**. He relates the case of a man, aged 21 years, who fell a distance of 15 feet, lost consciousness, bled from the nose, and vomited. He regained consciousness after a few days. He first noticed a clear watery discharge from the nose on the twentieth day, when he sat up for the first time. Death occurred on the twenty-seventh day from meningitis. The necropsy showed several fine cracks in the frontal bone and a slit in the basisphenoid through which a fine probe could be passed into the nose. He refers to another case previously recorded by him in which fracture of the frontal bone extending into the frontoethmoid region resulted from a bicycle accident. The patient recovered and resumed work, but was troubled by a watery discharge from the nose. Nine months after the accident he died from meningitis. Only one other case of cerebrospinal rhinorrhea after fracture of the skull in which the diagnosis was verified by necropsy has been recorded.

Henry S. Warren⁴ reports a case of **acute osteomyelitis of the cervical spine** following trauma. "As regards frequency of occurrence Hahn, employing the statistics of Frohner and Haaga, found that in 661 cases of infectious osteomyelitis the long bones were affected in 610 instances, the short and flat bones in 51, or 7.7 %. Among the short and flat bones only one vertebra was found affected. In 41 fatal cases of acute infectious osteomyelitis occurring in 17 years at St. Thomas's Hospital only one instance of an affected vertebra is recorded. Otto Hahn, in a recent study of a series of 41 recorded cases, gives the following data and general conclusions: (1) Sex: Males 23, females 12, and unknown 5. (2) Age: The great majority occur in the first two decades of life, being distinctly a disease of youth. (3) Location: Cervical, 7 times; dorsal, 12 times; lumbar, 17 times; sacral, 5 times. (4) Etiology: Evidence of undoubted trauma occurred 6 times. In 15 cases there was a history of trauma, in 10 instances the patient was perfectly well up to the onset, 3 cases were secondary to the disease elsewhere, and in one case a purulent paronychia was present; in the remaining cases no definite etiologic factor was determined." He reports a mortality of 60 %, and gives the following causes of death: Pachymeningitis, 2 cases; extensive pneumonia, 2 cases; retropharyngeal abscess, 1 case; empyema, 2 cases; gravitation abscess, 6 cases; amyloid disease, 1 case; invasion of the cord, 8 cases.

H. M. Chase⁵ reports 5 cases of **fracture of the hip in children**.

¹ Amer. Med., May 23, 1903.

² Amer. Med., Oct. 4, 1902.

³ Liverpool Med.-Chir. Jour., Oct., 1902.

⁴ Boston M. and S. Jour., May 7, 1903.

⁵ Boston M. and S. Jour., May 21, 1903.

"These cases emphasize the early age at which the fracture occurs, the possibility of fracture following rapid increase in weight, the occurrence of fracture from slight trauma, and the possibility of relatively slight disability following fracture of the femoral neck. They emphasize the fact that the bone may be fractured, giving rise to slight symptoms, the pain developing a number of weeks or months afterward without known cause; and that depression of the femoral neck from fracture predisposes to further depression and a consequent gradual increase of disability. In contrast to the effects of fracture of the femoral neck in later life, we see in childhood less marked immediate effects, while the remote effects are more disabling; and if recent cases of fracture pass unrecognized, danger lies in confounding their late results with hip disease."

Fifteen additional cases of **fracture of the neck of the femur treated with a Maxwell dressing** are reported by Ruth.¹ These, added to others reported by the author, make 40 cases treated in this way. The results obtained have been most satisfactory and far superior to those obtained by any other method. In order to reduce a fracture of the neck, the thigh is flexed upon the abdomen in order to relax the psoas and iliacus muscles; then, as the limb is again extended, an assistant makes traction outward and raises the trochanter to the same level as its fellow. Buck's extension apparatus is then applied to keep up extension. Binder's board is applied to the thigh high up and an extension apparatus applied which produces outward and upward traction of the upper third of the femur. Most excellent results are claimed from the use of this apparatus.

Thompson² discusses the **treatment of fracture of the neck of the femur** and reaches the following conclusions: "(1) I believe that the teachings and writings of surgical authors have been rather discouraging to the general practitioner on this subject. (2) That, in all cases of fractured femoral neck, firm bony union and useful limbs may be anticipated. (3) That age is not a contraindication to treatment nor to obtaining bony union. (4) That the patient is best treated by reducing the fracture and immobilizing it. (5) That this is best accomplished under anesthesia and by the use of the plaster-of-paris spica. (6) That the immobilization should be continued for a long time, and 3 months should elapse before allowing weight on the limb. (7) That Buck's extension with weight and pulley is not sufficient immobilization to obtain bony union. (8) That the use of apparatus in these cases is expensive, hard to obtain when needed, not so efficient in immobilization and less convenient for the patient and nurse than plaster-of-paris spica. (9) That the operative treatment in old and neglected cases has succeeded beyond all expectations and deserves a place in surgery among the radical cures for troublesome conditions. (10) That the patients who usually suffer from the accident are old and enfeebled is a good reason why the physician should make their declining years as peaceful and pleasant as possible."

¹ Jour. Am. Med. Assoc., Nov. 29, 1902.

² Jour. Am. Med. Assoc., Jan. 3, 1903.

J. P. L. Mummery¹ describes a **new method of treating fracture of the shaft of the femur**. "An extension stirrup is applied with strapping from the ankle to the knee in the usual way and the stirrup is fixed round the foot-piece of a Macintyre's splint, the thigh-piece of which should be made long enough to reach well up to the fold of the buttock. On the under side of the thigh-piece and close to its upper margin a metal hook is fixed (see Fig. 46). The best splint for the purpose is a Macintyre made so that the length of the thigh-piece can be adjusted by means of a thumb-screw and with a flat metal hook attached to the under side. An anterior splint for the thigh is then made of Gooch's splinting, or, better, of guttapercha, padded with a double layer of lint, and fixed to the thigh with webbings passed round the Macintyre splint. The fracture having been set the splint is now adjusted with the knee bent nearly to a right angle and the limb is fixed with bandages or webbings, as the case may be. A leather strap, which should be about an inch in breadth, is now passed through the lugs on the carriage of a Salter's cradle, then round the thigh-piece of the splint and caught in the hook on the under side. The buckle is then brought to one side and the strap is tightened until the buttock and the thigh on that side are lifted off the bed; when the strap is sufficiently tight it ought to be possible to pass the open hand beneath the buttock on the in-

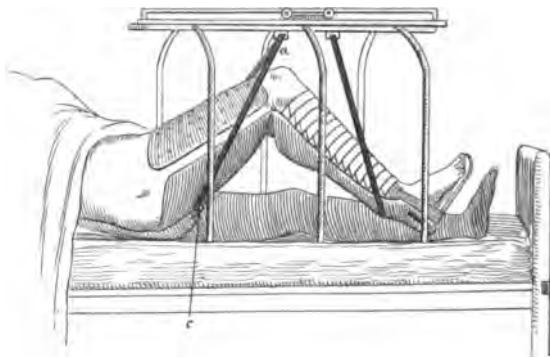


Fig. 46.—Mummery's method of treating fracture of the shaft of the femur. c, Hook on splint round which strap a passes (Lancet, Feb. 28, 1903).

jured side. Another strap is then passed round the lower end of the splint and fixed to the cradle to support the leg; this strap must not be too tight or it will depress the upper end of the splint. The upper strap will need tightening from time to time to make up for stretching, etc. All that is necessary in order to examine the site of fracture is to remove the anterior thigh splint. The advantages of this method are: (1) The nursing is very easy, as there are no weights, etc., and the cradle is the only thing that rests on the bed. (2) There is less tendency to movement at the site of fracture than with most other methods, as if the patient moves his body, or it should become necessary to move him for the purposes of nursing, the distal portion of the limb and the splint will tend to move with him rather than for the movement to take place at the site of fracture. (3) The splint is comfortable and the limb is in the natural resting position of semiflexion. (4) The apparatus is simple and easily applied. Movement of the knee-joint can be carried out from

¹ Lancet, Feb. 28, 1903.

time to time by screwing the splint straight with the key while the thigh is supported by an assistant."

John B. Roberts¹ describes his method of treating **transverse fracture of the patella** by subcutaneous purse-string suture. The only instrument used is a stout needle 5 or 6 inches long and a strong ligature of silk, wire, kangaroo tendon, or chromicized catgut. The ligature is carried around the fragments in the coronal plane and does not enter the knee-joint or the prepatellar bursa. It is necessary to perforate the skin with the needle at the four corners of the patella.

Mikulicz-Radecki² discusses the **treatment of fractured patella**. The operative and nonoperative methods give equally good results with a right interpretation of indications and a correct technic. Cases of fracture of the patella due to indirect violence in which the accessory ligaments are torn and in which the fragments are widely separated are suitable for operation. Fractures due to direct violence in which the ligaments remain attached to both sides of the patella, thus preventing wide separation, are treated by medicomechanical means. Those cases in which the fracture is produced by direct violence and in which the patients are unable to straighten the knees, the effort causing a perceptible increase in the separation, are suitable for operation. In the same way an increase in the gap occurs if the knee-joint is passively flexed. The decision as to operation must be made, at the latest, by the end of the first week; for the later one operates, the more difficult does the operation become and the more uncertain the result. The medicomechanical treatment is as follows: Immobilization of the joint for a short time with elastic compression to hasten reabsorption of the effused blood, massage of the knee-joint, especially the quadriceps, starting from the second to the fourth day; the patient gets up at the end of the first week with a removable plaster-of-paris splint, which he lays aside at the end of the third week. At this period careful active and passive movements begin, and later exercises with medicomechanical apparatus are employed. Mikulicz operates without exsanguinating the limb, makes a transverse incision, uses 3 or 4 brass wire sutures for uniting the fragments, always sutures the ligaments, practises asepsis only, does not drain, and conducts the after-treatment the same as if the patella were not sutured except for immobilization of the limb during the healing of the cutaneous wound. Of 45 cases, 16 were treated without operation. In 9 instances in which operation was not employed, the result was good in 8 and only moderate in one; in 2 of these cases the line of fracture could no longer be recognized with the x-rays. Suture of the bones was done 30 times for 29 patients. Of 17 cases of primary suture of the patella, of which the final result was known, only one showed a bad result. In 8 cases of late suture only one gave an unsatisfactory result."

H. P. H. Galloway³ reports a case of **fracture through the site of an excision of the knee-joint** 9 months after the excision. Serrations as deep as $\frac{3}{4}$ of an inch extended up into the femur and down into the

¹ Jour. Am. Med. Assoc., Jan. 3, 1903.

² Brit. Med. Jour., Dec. 13, 1902.

³ Canad. Jour. of Med. and Surg., Jan., 1903.

tibia, showing that the union between these 2 bones had been exceedingly firm.

Albert Carless and Stepen Mayou¹ state that fractures of the posterior segment of the os calcis are by no means common and that radiography has demonstrated the frequency of **fractures through the greater process of the calcaneum**. When a person falls from a height on the heels the force is mainly directed to the astragalus. Should, however, the violence be applied from above not quite vertically, a greater portion of the force will be directed either through the anterior or posterior segment of the arch formed by the astragalus. In the majority of falls there is some slight plantar flexion of the foot, so that the force is conveyed chiefly to the anterior section of the bone. "The head of the astragalus rests inferiorly upon the sustentaculum tali, and to a lesser extent upon the greater process of the calcaneum. Violence applied vertically would force these two surfaces together, but in addition to this the anterior edge of the posterior articular facet on the under surface of the astragalus would be driven downward into the outer end of the groove into which is inserted the interosseous ligament, particularly if there be any tendency for the anterior part of the foot to be twisted inward; the violence may be so great as to lead to an impaction of this edge into the upper surface of the greater process; these two forces acting concurrently, viz., the downward pressure of the astragalus on the inner side and the impacting blow of its sharp lower edge on the outer, are likely to break the greater process of the calcaneum across rather than to lead to rupture of the powerful and semicartilaginous inferior calcaneoscaphoid ligament. The one of fracture seems to vary, being sometimes from above downward and backward, sometimes downward and forward. This anterior fragment is sometimes comminuted, while impaction sometimes occurs. Flattening of the arch of the foot will be the necessary consequence of this lesion." Secondary lesions follow this forced flattening of the arch if the violence still continues to act, but the injury to the os calcis is almost invariably the primary fracture. The clinical signs in these cases are not very characteristic, and it would be difficult to distinguish them without the aid of radiography from fractures of the astragalus without displacement. The ecchymosis is usually a little above the fracture, since the tissues immediately below the malleoli are more prone to swell than are the plantar structures. "The heel is usually somewhat drawn up, and the foot is in a position of slight talipes equinus. The loss of the arch of the foot is not very evident owing to the swelling of the parts, but it looks longer than usual, and its vertical dimensions may be diminished. The movements of the subastragaloid and mid-tarsal joints are more likely to be impaired than those of the ankle itself, unless the astragalus is involved in the lesion. It is all-important in these cases to take radiographs not only from the side, but also from the front." Left to themselves, these fractures are liable to eventuate in a painful variety of flatfoot owing to the depression of the "head of the astragalus, and the formation of a large mass of callus on the under surface of the calcaneum,

¹ Practitioner, Dec., 1902.

occupying the cleft between the displaced under surface of the anterior fragment and the front end of the body of the bone. Another cause of the pain is a projection on the same lower surface due to the deposit of new bone from the torn periosteum beneath the insertion of the plantar ligaments. Unfortunately in this form of flatfoot the use of plantar pads is of very little use, as the constant pressure increases the pain." In the treatment an effort should be made to reduce swelling; then, while the patient is under the influence of an anesthetic, if the displacement be great the foot may be forced into a position of inversion, and be put up in plaster-of-paris. In old-standing cases with much pain and deformity it may be advisable to remove a wedge of bone irrespective of joints or to take out either the head of the astragalus or even the whole bone.

Robert B. Osgood¹ says that the **tibial tubercle of an adolescent**, because of its situation and mode of development, is susceptible to injuries, especially in athletic subjects. These lesions are usually caused by a violent contraction of the quadriceps extensor. Fracture and complete avulsions of the tubercle are rare, cause loss of function, and are easily diagnosed, usually clinically and always by means of the x-ray. Avulsions of a small portion and partial separation of the tubercle are more common. They do not cause complete loss of function, but without treatment, long-continued serious annoyance. The diagnosis should be made by a combination of the clinical and x-ray pictures, and before the latter are accepted as evidence both knees should be skiagraphed and accurate technic observed.

Murray² makes a study of **76 cases of simple fracture of the tibia and fibula** in order to discover the **ultimate results** of this injury. The patients were all treated in a Liverpool hospital (an institution in which about 250 fractures of the leg are received yearly). A tabulated list of the 76 cases is presented and the ultimate result in each case is stated. Murray does not approve of the ordinary straight posterior splint with the vertical foot-piece. He shows that the natural position of the leg when the patient is recumbent is one of slight eversion, and therefore he employs a splint the foot-piece of which is inclined outward at an angle of 70° and which has the same inclination forward. To place the foot at right angles to the leg tends to produce tension of the calf muscles and a consequent displacement of the fragments, hence the forward obliquity of the foot-piece. At the end of 4 weeks, when the fractured bones are united, movement of the ankle-joint and knee-joint, together with massage, is indicated. The usual mistake made in treating these cases is that the injured limb is kept in a state of immovability too long a time. In a case of oblique fracture of the tibia the patient should not be allowed to put the body-weight upon the limb until the end of the third month. It is practically impossible in certain cases of oblique and spiral fracture to produce a proper restoration of the parts. Although many of these patients recover with bad position, the function of the part is usually surprisingly good. Hemorrhage and inflammation of the soft parts together with piercing of the adjacent

¹ Boston M. and S. Jour., Jan. 29, 1903.

² Lancet, Sept. 13, 1902.

muscles and fascia by the sharp ends of the broken bone are the most frequent complications which interfere with the perfect reduction of the fragments. In deciding for or against an operation in an oblique fracture the character of the fracture together with the patient's avocation must be the deciding points. The author is a strong advocate of the use of the x-ray for diagnostic purposes in all doubtful cases of fracture. In a case of Pott's fracture in which restoration of the fragments is difficult, tenotomy can frequently be avoided by placing the foot in the position described.

W. Arbuthnot Lane¹ contributes a paper on **the mode of production of fractures of the lower extremity by indirect violence**. The ankle-joint may be regarded as a fairly perfect hinge-joint, in which any slight rotation of the astragalus outward around a vertical axis in abduction of the foot is associated with a torsion of the lower end of the fibula on its long axis by force acting at a great mechanical advantage; while in adduction, what torsion there is, is trivial in range and in the reverse direction, and is exerted with very much less force. If the foot is adducted by a force greater than it is able to bear, the head of the astragalus tends to become dislocated outward. If, on the contrary, the foot is excessively abducted, the tendency to rotation of the fibula upon its own axis may be sufficient to break that bone; while if abduction be carried still further, the astragalus and the rest of the foot are displaced backward upon the tibia, when the internal lateral ligament or the internal malleolus may also yield. In consequence of excessive forcible abduction a vertical or spiral fracture of the fibula, with displacement of the whole foot outward and backward upon the tibia with or without damage to the internal malleolus or internal lateral ligament, may ensue. The surgeon has no possible excuse to justify noninterference in these cases, as the disability resulting from any treatment other than the operative is generally marked. Careful consideration of the anatomy of the part, and of the mode of causation of such fractures, and experimental manipulations made at the operations, when the seat of fracture has been freely exposed, show how impossible it is to exert force upon the lower fragment of the fibula in a direction exactly the reverse of that by which the fracture was produced; in other words, how impossible it is to effect accurate apposition of the fragments by manipulation. "Spiral fracture of the femur is brought about by the transmission of an excessive vertical force through the lower extremity, which is fixed in a position of extreme external rotation at the hip-joint by means of the enormously powerful anterior portion of the capsule, upon an abducted foot. Here we have two forces acting in opposite directions upon the axis of the femur; one extends from the front of the great toe to the axis of the tibia, and the other from the axis of the shaft of the femur through the neck of the femur and pelvis. Both form levers, the extremities of which move along arcs in opposite directions. Skiagraphs show the hopelessness of any surgery other than operative, and they cast very natural doubts on the truth of the statements that are frequently made

¹ Practitioner, March, 1903.

as to the results obtained by treatment of these conditions by means other than operation."

JOINT DISEASES AND DISLOCATIONS.

F. C. Wallis¹ discusses the **treatment of the various forms of septic synovitis**. The author thinks that the septic origin of synovitis is frequently overlooked and that it does not receive sufficient attention at the hands of writers. The common mistake that is made is in attributing the condition to rheumatism. It will be noticed, however, that in the septic cases there is not the sweating which takes place in rheumatism. Two conditions which are nearly always present in septic cases and which are thought to be of diagnostic value are the dry, harsh, unpleasant state of the skin, and the restless, distressed, and unhappy mental condition of the patient. Cases of septic synovitis cannot be satisfactorily classified until a sufficient number have been carefully studied from a bacteriologic point of view. Such a study is rendered difficult by the fact that the condition frequently clears up without the necessity of opening the joint, provided the part is put absolutely at rest and the original focus of infection is properly treated. In gonorrheal synovitis which does not promptly yield to rest and the usual treatment Wallis recommends that the joint should be freely opened and washed out with warm salt solution. The wound is closed without drainage and the limb is kept at rest for 10 days or 2 weeks, and the joint is then massaged. It is not advisable to use an antiseptic solution in such joints. Whenever a single joint becomes acutely inflamed and distended with fluid in a young person and does not yield to treatment, no time should be lost in opening and irrigating the joint. This same treatment is recommended in cases of synovitis after influenza, those associated with osteomyelitis, and especially in those cases in which the condition is due to a streptococcic infection. Pyemic joints if operated upon early give surprisingly good results. Drainage in these pyemic cases is necessary. In cases of injury, also, followed by increasing temperature with great distention, local pain, and general distress, the joint should be opened and irrigated. [That in the past we have been too conservative in our treatment is certain. More cases suffer from conservatism than from refusal to operate.]

O'Connor² strongly urges **incision and drainage of joints in acute rheumatic fever**. He reports 20 cases of this condition in which he has opened and drained the joints with excellent results. In all of these cases medicinal treatment, both local and general, had proved ineffectual. The surgical treatment recommended not only causes the immediate disappearance of arthritis and the early cessation of general toxemia, but it also effectually protects the heart from involvement. O'Connor lays stress upon the fact that no operation should be undertaken unless the operator is able to carry it out with perfectly aseptic technic. The joint should be freely opened, thoroughly drained, and frequently irrigated.

In a paper on **hypertrophy of the synovial fringes of the knee-**

¹ Brit. Med. Jour., Jan. 3, 1903.

² Lancet, Jan. 24, 1903.

joint Edville G. Abbott¹ discusses the etiology, pathology, symptoms, and treatment, and reports 12 cases. His conclusions are as follows: Such cases should be considered independently, and should not be included among the other diseases of the knee-joint. A thorough microscopic examination of the tissue removed shows it is a simple inflammatory tissue, and is not the result of the action of microorganisms. Although the etiology is obscure, the disease is evidently due to some fault in the weight-bearing structures of the lower extremity, causing the ligaments of the joint to become lax. Since the matter was brought to Abbott's notice he has found that in all the cases examined by him a flattened arch has preceded the knee-joint trouble, and the use of a flatfoot plate has been of great service in treating the disease. The diagnosis is not difficult, although a torn cartilage somewhat resembles this condition. In all the cases operated upon an examination was made of the cartilages, and in every instance they were found to be intact. It is impossible to account for the paralysis of the quadriceps extensor muscle, which Abbott found in 3 instances; but in several of the cases operated upon, in which it did not exist before the operation, a similar condition was found afterward and was the last symptom to disappear. This shows that sometimes muscular paralysis occurs from trivial cause. Whether a patient should be treated by mechanical methods or whether he should be operated on, is a question which must be left to the judgment of the surgeon. Some apparently severe cases yield easily to treatment; others which are apparently slight will not improve until the fringes are removed.

Barnard² reports 9 cases in which he **drained the knee-joint both anteriorly and posteriorly for acute suppurative arthritis**. He states that acute pyogenic infection of the knee-joint is one of the most dangerous of suppurative diseases and one of the most unsatisfactory that a surgeon can be called upon to treat. Many of these cases occur in hospitals and follow wiring of the patella or the removal of the semilunar cartilages or foreign bodies, and terminate in death or amputation, ankylosed joints, and long-standing open sinuses. After referring to the failures from repeated or continuous irrigation of the joint and from extensive transverse incision dividing the patella or its tendon, Barnard advocates posterior as well as anterior drainage. Drawings are presented showing two posterior pockets of the synovial membrane where pus invariably accumulates and which cannot be drained through a lateral incision. These pockets can be found by making an incision directly over the posterior aspect of the condyles. Care must be taken not to injure the long saphenous vein and the external perineal nerves. These pouches terminate above and behind the condyles in the sacs which are beneath the corresponding heads of the gastrocnemius. Excellent results have followed this treatment in several of the reported cases, and all of them have been greatly benefited. Barnard advises that all really acute cases of suppuration of the knee-joint with high temperature should be treated by both anterior and posterior incisions, and particularly if the suppuration arises from punctured wounds. In cases due to autoinfect-

¹ Jour. Am. Med. Assoc., April 25, 1903.

² Lancet, April 25, 1903.

tion and in subacute cases in which the temperature is not above 102° he feels inclined first to employ the lateral incisions.

A method of resecting the knee without opening the joint is described by Marion,¹ who does not claim that the idea is original, since Wolkowitch practised the operation as early as 1896. The method of Marion, however, which is minutely described, is original. The classic curved incision is made beginning high up laterally and passes well down below the tubercle of the tibia. The skin-flap is then dissected up well above the limit of the subcrural pouch. The patella ligament is divided 1 cm. above the tubercle, and then the lateral expansion of the ligament. The periosteum of the tibia just above the tubercle is divided horizontally. This line indicates the point at which separation of the soft parts in the popliteal space should be begun. The quadriceps tendon is divided above the patella by a curved incision until the synovial pouch is reached. The separation of the tendon and muscle from the pouch is then accomplished. The pouch is easily separated from the anterior surface of the femur by means of a finger or a blunt instrument. A flat retractor is passed behind the femur and this bone is divided with a narrow saw so as to form a V-shaped end. The anterior division of the bone is made from the upper level of the synovial pouch and is carried bilaterally downward and backward. The posterior division is begun at a corresponding point and brought forward and downward. The tibia is divided so that the upper part is shaped like an inverted V, into which fits the V-shaped end of the femur. The soft parts are carefully divided in order to avoid opening the joint. All bleeding points are controlled after the removal of the tourniquet. A drainage-tube is inserted between the bones and the contents of the popliteal space. The dressings are allowed to remain in place for 25 or 30 days, when the drainage-tube is removed. The parts should be immobilized for a number of months. The great advantage of this method of operating is that the field of operation is not infected by the contents of the diseased joint. Marion reports 9 cases. In one of these subsequent amputation became necessary because of suppuration. Another died shortly after the operation from general tuberculosis. The other 7 cases were completely cured. Union of the bone occurred in from 2 to 6 months except in one case, and in this instance the patient removed the immobilizing apparatus. The cases reported were observed for from 2 to 3 years after operation. Because of the way in which the bone is divided sutures are unnecessary in order to produce fixation. It is claimed that the results are at least as favorable as those following the ordinary method; in no case has the immediate reproduction of tuberculous foci occurred; the only objection to the method is the removal of a considerable portion of bone. It should therefore be reserved for cases in which the bones themselves are diseased.

J. G. Sheldon² reports 3 cases, two of his own and one of John B. Murphy's, of **posterior dislocation of the head of the tibia**. In each of these cases reduction was easily accomplished under anesthesia and there was no evidence of injury to the vessels. Forty-eight hours after

¹ Arch. Gen. de Méd., Feb. 17, 1903.

² Ann. of Surg., Jan., 1903.

the injury in one case, 36 hours afterward in another, and two days afterward in the third there began to develop gangrene requiring amputation above the knee. Sheldon is able to find reports of only 52 other cases of posterior dislocation of the head of the tibia. The following is a synopsis of them: Total number of cases, 52; complete dislocations, 40; complete compound dislocations, 7; complete dislocations, with gangrene, 9; incomplete dislocations, 15; incomplete simple dislocations, 14; incomplete compound dislocations, 1; incomplete dislocations, with gangrene, 1; total number of compound dislocations, 8; and total number of dislocations with gangrene, 10. The occurrence of gangrene does not seem to bear any direct relation to the external evidences of injury. A reliable prognosis cannot be given on making an examination shortly after the occurrence of the accident. Another misleading feature in these cases—from a prognostic standpoint—is the fact that the first evidence of gangrene, or of impaired circulation in the injured member, may not be manifest for some hours or days after the injury. The impairment of the circulation may be indicated, at the time of the injury, by a very feeble posterior tibial pulse (Vast's and Wagner's cases). Usually there is no indication of impaired circulation until the third day; then the leg becomes cold and gangrene rapidly supervenes. These changes may come on as early as the second day or as late as the fourteenth.

Captain Hudleston¹ reports a case of **compound dislocation at the calcaneoastragaloid and scaphoastragaloid joints** occurring in a soldier. The injury was caused by the man slipping and his foot turning under him. It was found impossible to reduce the dislocation even under an anesthetic until the wound was sufficiently enlarged to allow of thorough inspection and manipulation of the joints. Reduction when this was done was easy and the patient made a satisfactory recovery without suppurating and obtained a useful joint.

Finley R. Cook² reports a number of cases in which he has employed the **Gibney adhesive plaster dressing for sprains** with excellent results. It is urged in sprains of the ankle that an attempt be made to diagnose the ligaments which are torn in order that the ankle may be strapped in the position indicated by the injury.

VENEREAL DISEASES.

At the closing session³ of the Second International Conference on the **Prophylaxis of Venereal Diseases and Syphilis** held at Brussels, September 1 to 6, 1902, the following resolutions were adopted: "*Resolution of Trois-Fontaines*: To give to conscripts arriving from their regiment very condensed, printed instructions on the dangers of gonorrhea and syphilis. To add to this a paragraph pointing out the necessity of always remembering any attack of venereal disease, in order to describe it later to the physician. Also to add, perhaps, some brief notes concerning the dangers of alcoholism and the prophylaxis of tubercu-

¹ Brit. Med. Jour., Feb. 21, 1903.

² Med. Rec., Jan. 10, 1903.

³ Med. Rec., Sept. 27, 1902.

losis. To be assured that the man leaving the service carried these instructions away with him as he did his military certificate. *Resolution of Neisser, Gaucher-Judassohn*: It was desirable that a guarantee be made, to each patient suffering from venereal diseases, of gratuitous treatment, to the largest possible extent. It was necessary to see that all factors unfavorable to venereal patients should be abolished from hospitals and consultations. It was necessary to see that in public institutions the treatment respected the medical secret and the shame of the patients. *Resolution of Minod*: The most important and the most efficacious means to employ to combat the diffusion of venereal diseases consisted in the dissemination to as great extent as possible of the knowledge relative to the very grave dangers, and to the importance of these diseases. It was necessary especially to teach young men that not only were chastity and continence not harmful, but that these virtues were the most valuable from the medical standpoint. *Resolution of Santiliquido*: Whereas, the different statistics ought to be in a condition to be compared: (1) It was necessary to establish statistics on a uniform basis. (2) It was necessary to submit the task of their compilation to an international bureau. (3) The President of the International Bureau ought to transmit these propositions that had been submitted to it to the various governments and should take their advice on the formation of this bureau and on the subsidies. *Resolution of Franck*: The Conference should issue the resolution that the problem of rational and progressive education of the questions of intersexual order, from the hygienic and moral point of view, should be brought before the institutions for the education of the young in all degrees. A committee was appointed to determine the preliminaries for the compilation of a treatise, based upon already existing monographs and larger works, which might serve as a tract for the instruction of the general public regarding the dangers of venereal disease, the means of prevention of the same, and the necessity of immediate and persistent treatment. The committee was also instructed to devise means for the popularization of such a work, for its translation into the principal languages, and for its general distribution in all countries of the civilized world."

Ludwig Weiss¹ concludes a paper on **venereal prophylaxis** as follows: "Prostitution is the main source for venereal diseases. Its suppression during the present moral evolution of the race is impossible. Moral regulation of vice solely is a desirable ideal, but impossible of realization. Reglementation as practised in continental countries is impracticable here on constitutional grounds and on the ground of its limited hygienic value. Moral efforts (social, economic, educative, and legislative) combined with sanitary measures are promising of results. As sanitary efforts under existing circumstances can step in only after infection has already taken place, a liberal supply of hospitals and dispensaries with free treatment must be provided for purposes of treating and sterilizing sources of contagion. Individual prophylaxis is at present the only feasible means of preventing in part the spread of venereal diseases. It

¹ Jour. Am. Med. Assoc., Jan. 24, 1903.

is the duty of every physician to recommend it. The Section on Cutaneous Medicine and Surgery of the American Medical Association should strive to bring about a uniform nomenclature, and the Association should institute through this Section a propaganda of action in the different States; to bring about under its auspices a national meeting similar to the International Conference for the Prophylaxis of Venereal Diseases which meets again this year in Brussels."

Ferd. C. Valentine¹ summarizes an article on **the educational limitation of venereal diseases** as follows: "(A) *Preliminary education*: (1) Sufficient of the physiology and pathology of the genitourinary apparatus should be taught, in institutions for higher education, to convey to students the dangers of genitourinary diseases to themselves and to others. (2) Similar instruction should be given in schools attended by boys at the age of puberty. (3) No man who has ever had gonorrhea should be allowed to marry until it is proved by a physician that he cannot infect his wife. (4) Regular physicians should be elected, by their societies, to deliver evening lectures to the public on genitourinary diseases. (5) Every father should be taught to warn his sons of the dangers of genitourinary diseases. When from incompetence or delicacy the father cannot or does not wish to do this, the family physician should discharge that duty. (6) Every medical society should elect its most competent member to write at least one article on the subject, worded for laymen's comprehension, and to be published under the auspices of the society. That the essential parts of these suggestions are feasible is proved by the public teachings established in several institutions, notably, among them, at Professor Lassar's clinic in Berlin. (B) *The segregation of prostitutes* would free reputable neighborhoods from the evil influences, bad example, demoralization, and infection of this social disease. It would also be of assistance in the enforcement of the proposed laws, and likewise it would tend to suppress assignation houses, which are nothing but conveniences for clandestine prostitutes, the worst disseminators of venereal diseases. (C) *Periodic examination*: The concentration of prostitutes in districts set aside for them would facilitate examination as to their ability to infect others. Such examinations should be made every day, as an approach to effective work. That it cannot be more than an approach has been elsewhere discussed. (D) *Circularization* would serve as a species of postgraduate education, which would warn men against the dangers they incur."

Follen Cabot² presented to the Harvard Medical Society of New York city printed slips containing **instructions for patients suffering from venereal diseases**. These instructions are as follows: "*Instructions to those having gonorrhea or 'clap'*: Gonorrhea or 'clap' is a local contagious disease which requires treatment until the physician pronounces you cured. To avoid infecting others and to prevent complications, as bubo, stricture, swollen testicles, etc., the following rules should be observed: (1) During the first few weeks walking should be limited. When the discharge is profuse, you should keep off your feet as much as pos-

¹ Med. Rec., Nov. 8, 1902.

² Med. News, Jan. 3, 1903.

sible. (2) Do not use alcohol in any form, as it always prolongs the disease. Drink milk, tea, vichy, or seltzer and from 6 to 8 glasses of water during the day. (3) Avoid all sexual relations until you have been pronounced cured by your physician, as the disease may be given to a woman even after the discharge has apparently ceased. When it is present you should avoid sexual excitement, as erections always aggravate the disease. (4) Always wash the hands after handling the parts. The discharge if carried to the eyes will cause blindness. (5) Sleep alone and be sure that no one uses any of your toilet articles, particularly towels and wash cloths. (6) Never lend your syringe to any one and as soon as you are well destroy it. (7) Be sure that the bowels move every day. If they are inclined to be constipated take a dose of rochelle salts before breakfast. (8) Do not use mustard, pepper, horseradish, or stimulating sauces on your food. *Instructions to those suffering from syphilis:* Syphilis is a constitutional disease. It is 'in the blood.' Local remedies and taking medicine for a few months will not cure you. You must be treated for 3 years. The effects of this disease are far-reaching, and if treatment is neglected much trouble and suffering may be caused, not only to yourself, but to others. The following rules must be observed during the first year: (1) Sexual intercourse should not be indulged in. (2) Alcohol in all forms should be avoided as it always aggravates the disease. (3) Do not smoke or chew tobacco. (4) Sleep alone. (5) Under no circumstances should any one be allowed to use your toilet articles, as towels, brushes, combs, razors, shaving-brushes, etc. (6) No article that has been in your mouth should be used by others, as tooth-brushes, toothpicks, pencils, pipes, cigars, cigarets, forks, spoons, drinking-cups, etc. (7) You must not kiss any one, especially children. (8) Brush your teeth night and morning and keep your mouth clean. (9) If you have bad teeth, have them attended to by a dentist, and be sure to tell him that you have syphilis, so that he can take necessary precautions and avoid the possibility of infecting others. (10) Acids in food and drink should be limited."

In discussing the incubation period of gonorrhea in women, G. Frank Lydston¹ states that the disease "may develop: (1) As a discharge from the cervix, showing a primary infection of the endometrium; (2) as a metritis without noticeable discharge even from the cervix; (3) as a pelvic inflammation without preliminary or coincidental discharge of any kind whatever. In many instances serious pelvic inflammation is neither preceded nor followed by discharge of any kind. In any case of possible infection of innocent women it is well to defer judgment until at least one menstrual period has passed. If the exposure has occurred within two or three weeks of the preceding period, two periods should be allowed to pass before an opinion is given. In any case, the question should not be settled by the appearance or nonappearance of a discharge."

S. T. Rucker² describes his **method of treating inflammatory diseases of the urethra by packing with an antiseptic oiled dressing.** After irrigation with a 1 : 3000 solution of potassium permanganate the

¹ Internat. Jour. Surg., March, 1903.

² Jour. Am. Med. Assoc., Oct. 1, 1902.

penis is grasped with the fingers of one hand and the packer (Fig. 47) introduced slowly and carefully into the urethra with the other hand. It is passed back about 4 inches in anterior gonorrhea and back to the neck of the bladder in posterior gonorrhea and prostatic troubles. The urethra is then lightly packed with one inch continuous gauze strips, or,

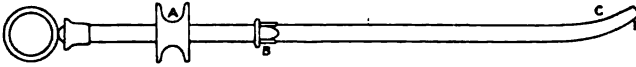


Fig. 47.—Rucker's instrument for packing the urethra. A, Groove for index and second finger; B, slide; C, end slightly tapered and curved; D, edge rounded and smooth (Jour. Am. Med. Assoc., Oct. 1, 1902).

better, a loosely spun cotton cord, saturated with one of the following solutions:

R. Iodoform gr. xcv
 Balsam of Peru $\frac{3}{4}$ iv
 Castor oil q. s. ad $\frac{3}{4}$ iv

Rub iodoform in castor oil, then add balsam of Peru. Or: .

R. Ichthyol,
 Resorcin, aa gr. xl
 Balsam of Peru $\frac{3}{4}$ iv
 Castor oil q. s. ad $\frac{3}{4}$ iv
 M. Ft. sol.

The instrument is gradually withdrawn as the dressing is pushed through, and when it emerges from the meatus the cord dressing is clipped with scissors, leaving about $\frac{1}{4}$ inch of the cord outside of the meatus, which can be taken between the fingers when the cord is to be removed. A small piece of cotton is placed over the head of the penis and treatment is complete. The patient is now instructed to go as long as he possibly can before urinating, when the cord is slowly removed. The urethra is packed every day until the discharge ceases, and then on alternate days for a week. During the intervals the patient uses an injection of protargol.

James MacMunn¹ believes that the efficacy of remedies in gonorrhea is in direct proportion to the extent to which they penetrate into the tissues. For the purpose of retaining solutions in the urethra he uses "mechanical fingers which occlude in a self-acting way the urethra where placed. Their pressure is graduated by the nut *a*, and they are actuated by a concealed spring (see Fig. 48). No discomfort whatever follows their intelligent use. The clamp is pinned to the inside of the inside shirt, and the patient rests or goes about with that quantity of fluid, and of proper strength which he finds not uncomfortable, distending his anterior urethra."

H. M. Christian,² from a clinical study of argyrol in the treatment of gonorrhea, concludes: "(1) That it is absolutely free from any irritating properties, solutions as high as 5 % causing no discomfort. (2) That the gonococci on and beneath the urethral mucous membrane are

¹ Lancet, April 18, 1903.

² Med. Rec., Sept. 27, 1902.

rapidly destroyed. (3) The amount of urethral discharge is in a majority of cases at once lessened in a marked degree. (4) The actual duration of the disease is shorter than is obtained by the use of any other silver salt. In our cases 38 were cured in from 2 to 4 weeks." R. O. Kevin¹ is convinced of the value of argyrol in the treatment of gonorrhea. In the acute cases a solution of from 1 % to 5 % is used. In chronic cases the drug may be used of a strength of 20 %. G. K. Swinburne² states that argyrol contains nearly 30 % of silver. It possesses but one drawback, and that is its staining properties. "This drug has decided gonococcal powers; it has a decided effect in reducing and allaying inflammation of the disease; it can be used safely in almost any strength and at any stage of the disease; the injection can be repeated almost as frequently

as the fancy of the physician dictates; I have not seen any unpleasant symptoms due to the use of the drug, and I believe it to be one of the most valuable remedies given to the profession in recent years."

Orville Horwitz³ reports an **extensive inquiry into the value of the irrigation method as a means of aborting and treating acute specific urethritis**, and presents the views of a large number of genitourinary surgeons. His conclusions are as follows:

(1) The irrigation method of treatment will not abort acute specific urethritis. (2) It will hasten the terminal stage of the disease, which is prolonged and difficult to cure. (3) Chronic urethritis and involvement of the deep sexual organs are common sequences. (4) In many instances, in order to effect a cure in the terminal stage of the disease, the irrigations must be discontinued and other methods of treatment employed. (5) Irrigation should not

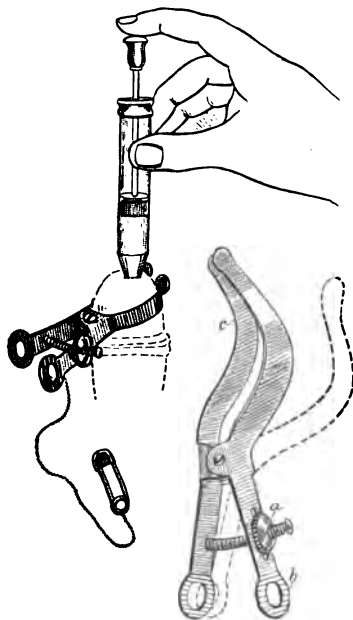


Fig. 48.—MacMunn's instrument for retaining solutions in the urethra (Lancet, April 18, 1903).

be employed in the acute stage of specific urethritis. (6) Irrigation of the deep urethra by means of hydrostatic pressure is injurious in the majority of cases of acute gonorrhea, and is conducive to the development of complications. (7) Little or no progress has been made in the treatment of acute urethritis, either in aborting the disease, lessening its duration, or preventing complication.

H. G. Klotz⁴ writes of the satisfactory results which he has obtained with **albargin in the treatment of gonorrhea**. The drug may be used in solutions as strong as 5 % without injury to the urethra. "Albargin

¹ Med. Rec., June 6, 1903.

² Therap. Gaz., March, 1903.

³ Med. Rec., Oct. 11, 1902.

⁴ Med. News, Nov. 29, 1902.

is a compound of silver nitrate with gelatose, a product of the dissociation of gelatin; it contains 15 % of silver nitrate or with 63.5 % silver for the nitrate, 9.52 % of silver against 8.3 % in protargol. Albargin forms a yellowish or light fawn-colored, rather gross powder of very light weight, is slightly sticky, and dissolves easily in water of any temperature. It is clean to handle, does not stain the fingers at all and the clothes but very little, it is not expensive, not only on account of the actual price being lower, but also because it is generally prescribed in comparatively much smaller quantities."

W. W. Townsend¹ describes an **insufflator for the treatment of chronic anterior urethritis**. "The instrument consists (see Fig. 49) of a (D) glass rod, 22 French, bent at right angles, perforated by a canal B bored through it from end E to air chamber C, and with another canal A extending from air chamber C and having an outlet at A1. The

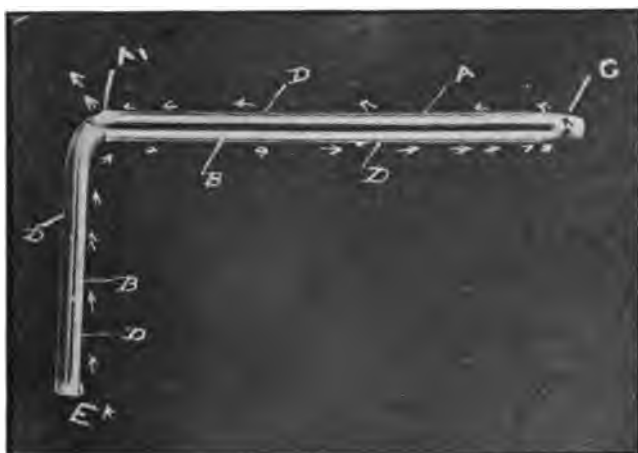


Fig. 49.—The Townsend duplex insufflator. Powder container attaches at E (Amer. Med., June 20, 1903).

air chamber C, as will be seen, is perforated at its proximal end by the openings of the canals A and B, and its distal end is open except when in the urethra, at which time the urethral walls fall over the end, thus making a closed air chamber. When this insufflator tube is attached to a powder container at E and the powder forced, it will follow the direction of the arrows, and reaching the air chamber C will become agitated and a portion will adhere to the mucous membrane of the urethral walls. As the powder is forced from the container into the insufflator, the tube is gradually withdrawn, and the mucous membrane of the urethra is consequently covered with the medicament used." Townsend insufflates powders of zinc, copper, or aristol 3 or 4 times a week.

Ferd. C. Valentine² concludes a paper on the **morning drop** as fol-

¹ Amer. Med., June 20, 1903.

² Med. News, July 19, 1902.

lows: "(1) The morning drop is ordinarily a symptom of local or constitutional disturbance. (2) When it is not due to either of these, it is maintained by overtreatment or artificial sexual irritation. (3) According to its cause, it must be treated; locally, if due to a local cause, and constitutionally, if faulty metabolism or food irritation be the provoking element; if sexual irritation be the cause, this must be stopped. (4) If the morning drop be due to overtreatment, it must be discontinued. (5) The cause of the morning drop is not difficult to ascertain. (6) Its treatment is within the sphere of the general practitioner."

From a study of the relation of gonorrhea to tuberculosis of the genitourinary tract Daniel N. Eisendrath¹ draws the following conclusions: "(1) In patients suffering from an acute gonorrhea there may be an almost imperceptible transition into a malignant type of tuberculosis. (2) Subacute or chronic gonorrhea may mask the presence of a tuberculosis. That these, as well as the acute form, may act as predisposing, and even at times as exciting, causes of tuberculosis. (3) In patients who show evidence of local complications of gonorrhea, such as prostatitis, vesiculitis, cystitis or epididymitis, one should always bear in mind the possibility of tuberculosis, and examine the urine for tubercle bacilli, if antigonorrheal treatment causes no improvement. (4) In patients with marked tuberculous history an attack of gonorrhea should be carefully watched, and the prognosis be guarded. (5) Gonorrhea, both in the male and female, often prepares the soil for a later invasion of the tubercle bacillus."

DISEASES OF THE BRAIN AND NERVOUS SYSTEM.

Francesco Durante,² of Rome, makes certain observations on cerebral localizations, from which the following conclusions are drawn: "(1) Lesions, especially those determined by neoplasms, of the frontal lobes are nearly always accompanied by very grave phenomena of altered intelligence; which proves that the frontal lobes, and particularly the prefrontal, must be considered as the seat of the most elevated functions of the mind. (2) The cortical center for hearing is situated in the temporal lobes, each center is in relation with both the auditory nerves, and the direct auditory bundle must be very much less active and smaller than the crossed auditory bundle. (3) The site of the center for general sensibility and for muscular sense is in the parietal lobes, and disturbances of general sensibility and of the muscular sense may occur in the limbs independently of any disturbance of motility whatsoever. (4) For the solution of various problems concerning the functions of the several regions of the human brain, operative surgery and pathologic anatomy are more useful than experimental physiology, which has animals only at its disposal; the functional arrangement of the brains of such animals has some analogy with that of man, but certainly cannot be compared with it in every respect."

The subject of trephining for brain tumors is presented by Ranso-

¹ Chicago Med. Recorder, Dec. 15, 1902.

² Brit. Med. Jour., Dec. 13, 1902.

hoff,¹ who reports two successful cases. The first case was operated upon 9 years ago and was reported by Hoppe. The author has performed 8 operations for supposed neoplasm, and but 2 of these operations were successful. The first patient continues well except for a slight paresis of the left extremities and epileptic seizures at intervals of 3 or 4 months. The patient was 32 years old at the time of operation; the tumor was the size of a hen's egg, and situated in the psychomotor area. There is no evidence of a return of the growth. The second patient was operated upon the first time on February 11, 1902. The dura was exposed and was normal in appearance, but devoid of pulsation. The opening in the skull was $3\frac{1}{2}$ inches long and 3 inches wide. Temporary sutures were introduced and a second operation done 3 days later. At this time the dura pulsated feebly; it was opened, but no tumor found. The patient was then put in the sitting posture, which permitted a much freer palpation of the brain. The tumor was found half an inch below the surface in the ascending frontal convolution and was easily removed. A slight paraphasia and inability, except with great effort, to move the right hand and forearm followed the operation. The tumor in this case was a solitary tubercle. Three and a half months had elapsed at the time of the report, since the operation: the patient had gained 15 pounds and had had no convulsions of any kind; there remained, however, a decided weakness of the flexors of the thumb, the index and the middle fingers. In this case the general symptoms of brain tumor were absent (that is, headache, choked discs, and vomiting). The symptoms presented were altogether focal. This is explained by the fact that when the tumor was removed it displaced 12 gm. of water, a mass pressure to which the brain accommodates itself. With the development of symptoms of intracranial pressure the value of focal symptoms decreases. This explains the frequency of failure to find a tumor when seemingly unmistakable localizing symptoms are present. Against 104 collected cases in which operations were successful as to finding and removing a growth, there are 157 in which the operation was unsuccessful in one or the other respect. Ransohoff refers to the great advantage obtained by placing the patient in a sitting posture, this position causing the brain to recede to such an extent that palpation is permitted far beyond the limits of the cranial opening. In doing a two-stage operation the second operation can be done very satisfactorily under local anesthesia. This plan was successfully followed in the second case until it became necessary, in order to remove the tumor, to cut away more bone, when chloroform was administered. Haas has collected 122 operations which were successful as regards the removal of a tumor, and which presented a mortality of 61 %. The high mortality is ascribed to shock and hemorrhage. Ransohoff thinks that with the more general adoption of the two-stage operation this mortality will be greatly lessened. Tuberculous growths are nearly twice as common in the brain as any other type. In the cases operated upon, however, this variety is not so common, being present but 12 times, for instance, in

¹ Jour. Am. Med. Assoc., Oct. 11, 1902.

Haas's 122 cases. Bergmann's dictum that solitary tubercle is ordinarily not suited for operation is believed to be incorrect, a number of cases having been reported as cured after the removal of tuberculous growths. [One reason of the very large mortality is that so many cases are operated on late rather than early. A brain tumor not due to syphilis is a mortal disease without operation; hence, if a brief but thorough trial of specific treatment is not productive of distinct benefit, an operation is indicated provided the tumor is thought to be in an accessible region. Mills has demonstrated that an x-ray picture taken by an expert may show the tumor. The opening made in the skull should be large. The making of a large opening does not add materially to the danger; a small opening may cause us to miss the tumor, and even if we find it the removal of a large growth through a small opening causes great damage to the brain. It is well, as Mills advises, to be prepared to close the carotids

temporarily if dangerous hemorrhage is encountered. In some cases certainly the operation should be done in two stages.]

Chas. K. Mills¹ discusses brain tumors from the neurologic standpoint, taking as a basis for his paper his personal experience in 22 cases in which operation was performed after a diagnosis of tumor or cyst had been made. The author believes in operations for the removal of brain tumors in carefully chosen cases even though the percentage of failures is high. In almost every case the outcome

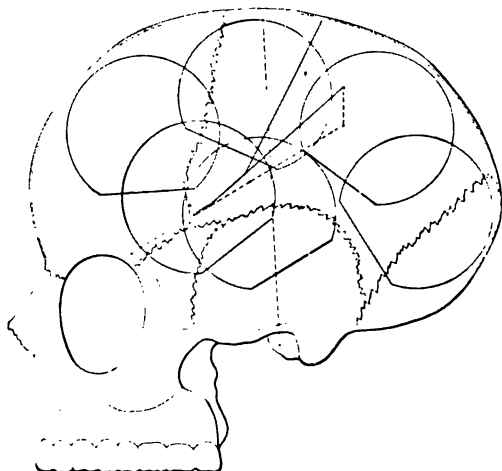


Fig. 50.—Cranial areas for osteoplastic operations with the Stewagen trephine, these areas corresponding to the regions of the left hemisphere, with definite syndromes (Mills, in Phila. Med. Jour., Nov. 29, 1902).

without operation is necessarily fatal, and with more exact localization and more precise craniocerebral topographic methods and with more perfect surgical technic the percentage of successes has been and will be much increased (see Fig. 50). Much is to be hoped for in cases of fibromas, encapsulated fibrosarcomas, inert gummas, and occasionally in other forms of neoplasms. Particular attention is paid to the method of locating brain tumors, the author preferring the Anderson-Makins method. The causes of failure in operations for brain tumor are enumerated as follows: (1) Mistakes in localization; (2) lack of exactness in fixing the cranial areas for operation; (3) excessive hemorrhage; (4) concussion and even contusion of the brain in osteoplastic operations with chisel and mallet; (5) prolongation of operations; and (6) the sudden disturbance of the balance

¹ Phila. Med. Jour., Nov. 29, 1902.

of pressure in the skull by the removal of large hard tumors. Methods of localization are becoming more and more perfect and mistakes fewer. Tumors of the cerebellum often present especial difficulties. The x-ray is a useful diagnostic measure in certain cases, and the author refers to several instances in which this means of locating a brain tumor was proved of value. The exact localization of the tumor and the fixation of the positions of the various fissures and lobes should not be postponed until just before the operation. The large osteoplastic operation is the only one which should be employed for the removal of brain tumors except when the growth is so located as to render this method inapplicable. Mills thinks very highly of the Stellwagen trephine, and considers it a great improvement over the mallet and chisel. He refers to several cases in which the flap was made in a short space of time with this instrument. Unusual difficulties and dangers attend cerebellar or basal operations for tumors. Still, an operation is justifiable in cases in which a tumor is probably situated laterally in the cerebellum. Excessive hemorrhage in several of Mills's cases was the cause of failure and directly or indirectly the cause of death. It is suggested that the surgeon should always be prepared to practise compression of the carotids to control excessive bleeding. In exceptional cases it is believed that the operation should be done in two stages, as suggested by Horsley and Macewen. The article closes with a description of a successful operation by Hearn for a gumma in the motor region. [Hearn and DaCosta each opened the skull of an adult with the Stellwagen trephine in less than 8 minutes. This is a considerable saving of time over the operation with the chisel and mallet. Further, the operation does away with forcible and, we believe, dangerous pounding.]

J. D. Madison¹ reports a case of **brain tumor occurring in a woman 78 years of age**. The rarity of brain tumor at this age is shown by the fact that in 100 cases collected by Hale White there were only 2 over 70 years of age, and in another 100 cases collected by Mills and Lloyd there was only 1 case over 70 years of age. The tumor in the case reported is described as a gliosarcoma containing several cysts. The growth involved a large portion of the temporal lobe. It reached the surface only ventrally. It extended to the basal ganglions, but only slightly involved the lenticular nucleus.

Roughton² reports a case of **cerebellar abscess** for which Cunning operated during the performance of **artificial respiration**. During the first 10 days that the patient was under observation his only constant symptom was an abnormal slowness of the pulse. During this time the headache, mental slowness, dizziness, vomiting, and tenderness over the mastoid all improved. Later these symptoms, and also a subnormal temperature, returned. The only localizing symptoms were an exaggerated knee-jerk on the left side and inability to lie on the right side. The former turned out to be accurate, but the latter did not. Under chloroform anesthesia the pulse rose from 42 to 120. Soon after the administration of chloroform the patient ceased to breathe, and for 80

¹ Am. Jour. of Insanity, Jan., 1903.
18 S

² Lancet, July 26, 1902.

minutes artificial respiration was kept up, during which time Cuning explored first the right hemisphere of the cerebellum and then the left, evacuating from the latter a quantity of foul-smelling pus. The moment the pus was evacuated there was return of spontaneous respiration. Consciousness returned 3 hours after the operation, and the patient then developed convulsive attacks and died 3 hours later, or 6 hours after the performance of the operation.

J. Grant Andrew¹ reports a case in many respects similar to that just described by Roughton. The condition was one of **cerebellar abscess following middle-ear disease** in which the abscess was not drained, although an exploration of the cerebellum was made, and it is thought from postmortem findings that the needle entered the abscess cavity but became occluded so that the pus could not flow. Respiration in this case failed before the operation was commenced and was not re-established for 80 minutes, during which time artificial respiration was continuously performed. After the restoration of respiration the operation was performed. The patient died about 30 hours after the operation.

McCaskey and Porter² report a case of **brain abscess** due to latent **typhoid infection** and situated in the motor area. The abscess was drained and the patient did well until the eighth day, when he suddenly complained of feeling very ill, and became pallid, and developed labored respiration and tumultuous heart action. There was no change in the paralysis which followed the operation nor was there any other evidence of further cerebral involvement. Death ensued, and it is thought that it was due to an acute cardiac lesion, very possibly relating to the septic process in the brain, probably a septic endocarditis with cardiac atony from toxemia.

In discussing **thrombosis of the lateral sinus**, Ballance³ states that before or during operation the surgeon should decide whether his patient is suffering from an acute systemic infection or from a systemic disturbance depending upon a local process. Operation upon the vein should be done: (1) in acute pyemia and acute septicemia, whether the sinus is occupied by a clot or by fluid blood; (2) if the sinus is gangrenous or its contents are putrefying, unless it is quite clear that the sinus is blocked on both sides by noninfected clot, and this is rare; (3) if it is known or suspected that the blood in the jugular bulb is in part or wholly clotted; and (4) if the jugular vein is thrombosed. When it has been decided to deal with the vein before beginning to operate, the operation on the vein should precede that on the temporal bone. Ablation of the vein is better than ligation. After dealing with the vein the sinus should be thoroughly exposed for a distance of at least $\frac{3}{4}$ of an inch beyond the area of inflammatory change. The freest exposure of the sinus is required. The method of curetting away putrefying clot through an opening in the sinus is one which should be abolished from surgery. The sinus should be slit up, if necessary, from torcula to bulb. The cases demanding operation and the procedure to be carried out in each par-

¹ Brit. Med. Jour., May 2, 1903.

² Jour. Am. Med. Assoc., May 2, 1903.

³ Lancet, Sept. 20, 1902.

ticular case require the greatest surgical judgment. The surgical treatment should be the same whether the condition is chronic or acute.

Eugene Wasdin,¹ of the Marine Hospital Service, reports an instructive case of **gangrenous destruction of the pituitary body with disintegration of the blood** following a fracture of the sphenoid bone and subsequent infection. The author was unable to understand the condition in this case until he read Sajous's article on the internal secretions. The patient was a man aged 24 years who was admitted to the hospital for a fracture of the ramus of the jaw. Great care was taken to prevent infection and the patient did well for some days. He presented no symptoms indicating a possible fracture of the base of his skull until the thirteenth day, when he developed a delicate yellowing of the skin of the face and body, and some discoloration and edema of the cheek. As there was great pain in the fracture on the tenth day, the soft tissues over it were divided but no pus was found. On the sixteenth day the bronzing of the skin was much more marked, there was nothing to indicate an implication of the liver, and the edema and discoloration about the exit of the right infraorbital foramen were distinct. The spleen later became tender and a few small skin extravasations developed which increased both in number and size. On the nineteenth day there was marked exophthalmus with edema of the conjunctiva. Repeated examinations of the blood were made. The hemoglobin was below 50 % and marked disintegration was present. A diagnosis of fracture of the sphenoid was made. The patient died and at the autopsy the pituitary body was found to be gangrenous; the process also involved all the contents of the sella turcica. The middle and posterior clinoid processes were necrotic. There was a dark green mass near the carotid opening of the petrous bone involving the gasserian ganglion. Cultures were taken from various organs, but all proved sterile save those from the pituitary mass and one from the liver. The former culture showed a short thin rod-like bacterium which grew more readily in air than without oxygen. The culture from the liver was the colon bacillus.

Coutts² reports a case of **acute endymitis occurring in an infant 3 months old**. The condition was described as one of postbasal meningitis. During the 6 weeks that the child was ill it was necessary to feed it through a nasal tube. Convulsions frequently occurred during the illness. The anterior fontanel bulged distinctly, and through it a futile attempt was made to remove fluid from the lateral ventricle. Upon postmortem examination the lateral ventricles were found distended with offensive pus, and the foramen of Majendie appeared to be completely blocked. There was no macroscopic dilation of the central canal of the spinal cord. The bacteriologist is doubtful whether a bacterium which was found was a variety of the pneumococcus. Coutts believes that this case was one of primary acute inflammation of the ventricular ependyma. It has always been, as it was in this case, impossible to diagnosticate the condition. The onset of the symptoms was much more severe and persistent than in an ordinary case of postbasal meningitis. The

¹ Phila. Med. Jour., March 7, 1903.

² Lancet, April 25, 1903.

temperature also toward the end of the third week began to rise, while in most cases of postbasal meningitis it has by that time reached normal or fallen below it.

Sheild and Shaw¹ report an interesting case of **linear fracture of the skull**. In this patient symptoms of early **general paralysis of the insane developed**. The patient was a healthy man 30 years of age who 3 months after sustaining a scalp wound in the left frontal region developed a peculiar mental condition. At the time of the injury no fracture was found and the man was confined to bed for a short time because of concussion. He was perfectly well for some weeks, but about a month after the injury commenced to suffer pain in the head, and developed loss of memory, and sudden and violent outbursts of passion. These symptoms continued until the patient reached a mental condition of dementia. There being no history of alcoholic excess or of syphilis, the symptoms appeared to be directly attributable to the injury. Shaw trephined the skull at the point of injury and found a healed linear fracture with a depression of the inner plate. Immediately after the operation there was a most marked improvement in the patient's condition. Whereas before the operation he could not read or sign his name, a short time after the operation he could read as well as ever and walk without difficulty. He ultimately recovered.

Bullard,² after considering the **indications for operations in head injuries**, reaches the following conclusions: "(1) Operate in all cases of compound depressed and compound comminuted fracture of the cranium. It is usually advisable to operate on any compound fracture. (2) Simple fracture of the cranium without symptoms does not, as a rule, demand operation. (3) Absence of unconsciousness does not contraindicate operation. The degree of unconsciousness is not in all cases proportionate to the severity of the injury. (4) The duration of unconsciousness is important, and when it lasts more than 24 hours,—no other cause than the injury being present,—operation should be considered. (5) Marked rise of temperature after uncomplicated head injury suggests serious injury to the brain. It is not necessarily an indication for operation. A subnormal temperature without other symptoms has no special significance. When accompanied by unconsciousness and lasting 24 hours or more it suggests edema of the brain or intracranial hemorrhage. (6) Severe pain in the head continuing for some time after a head injury, if organic, indicates operation. Pain in the head following injury may, however, be functional and due to general nervous conditions. (7) Convulsions, when clonic and diffuse, suggest epilepsy or other complication. When localized they are of value as indicating the side of the brain on which the lesion producing them is situated. Taken in connection with other symptoms their presence usually favors operation. (8) The presence of paralysis of the limbs in adults, if marked, usually indicates immediate operation. Partial hemiplegias and paralysis of the limbs may occur in edema of the brain following injuries. (9) The above statements refer to adults only. In children paralyzes are more apt to pass away and the indication for operation is not so decided."

¹ Lancet, Feb. 14, 1903.

² Boston M. and S. Jour., July 31, 1902.

E. W. Dwight¹ presents a discussion of the **indications for operations in head injuries** based upon a collection of 650 cases in which a fracture of the skull was demonstrated either by autopsy or operation. A study of these cases shows the great variability of symptoms in the various lesions of the brain. So variable in fact are these symptoms that the author is only able to formulate a guide as to whether or not operation should be undertaken. He concludes as follows: "Given positive signs of intracranial disturbance following an accident which might well cause such a condition, but without definite signs of fracture, I should explore. Given a case in which there is probable evidence of fracture, and a probability of interference with the brain, I should operate. I have never seen fatal or serious results follow trephining by skilful hands, even when 2 or 3 openings in the skull were made, and I have seen many lives saved by exploratory operations in this very large class of doubtful head injuries."

Newman² gives a report of 3 cases of **motor aphasia from head injury**, in 2 of which operation was done and recovery followed. In the first case reported the patient had a fall from a bicycle followed by unconsciousness and incontinence of urine, and, after 3 days, by epileptiform seizures which increased in frequency. Consciousness returned and showed the presence of motor aphasia. On the ninth day after the accident palsy of the right leg and arm began to develop, and on the tenth day it was complete. The epileptiform seizures at this time were also increasing in frequency. The patient was trephined over the motor area, and when the dura was opened about an ounce of blood escaped. Drainage was established and rapid recovery ensued. The operation was followed by immediate cessation of the epileptiform attacks and a rapid recovery of motion in the paralyzed leg. Speech was restored in 2 weeks. The second case was one of compound fracture of the skull. The symptoms presented were those of concussion with complete unconsciousness. On the fourth day slight twitchings of the right arm and leg were noticed and the patient developed an epileptiform attack; no paralysis was present. The patient was trephined on the fifth day, unconsciousness being so complete that no anesthetic was required. Epileptiform attacks disappeared after the operation, but upon the return of consciousness the man was found to be aphasic. Complete recovery had taken place by the twenty-eighth day after operation. The third case was one of a man who was injured by a fall from a bicycle. The fall was followed by complete unconsciousness and incontinence of urine. The patient was unconscious 11 days and the incontinence of urine continued for a month. There were no epileptiform attacks and there was no paralysis of the limbs. Evidence of motor aphasia was shown on the eleventh day after the injury. At the end of 4 months the man had recovered from the aphasia.

Cushing,³ in his Mütter lecture before the College of Physicians of Philadelphia, makes some **experimental and clinical observations**

¹ Boston M. and S. Jour., July 31, 1902.

² Lancet, July 26, 1902.

³ Am. Jour. Med. Sci., Sept., 1902.

concerning the states of increased intracranial tension. The subject is dealt with at great length and most minutely, the author showing beyond a doubt that as long as the vasomotor system maintains the blood-pressure at a level higher than the intracranial tension, so as to keep the respiratory center nourished, respiration will continue. If, on the contrary, it falls below the intracranial tension the patient succumbs with a low blood-pressure and a rapid heart action. At this time if artificial respiration is employed the patient may live for hours. Cushing closes his address by dwelling with emphasis upon certain points: "In the first place, the venous stasis, which becomes apparent on but a moderate increase of tension, fortunately gives early evidence of itself in the eye-grounds except in those cases of local compression, in posterior basic meninges, for example, so remotely situated that the compression effects are not readily transmitted as far as the cavernous sinus and ophthalmic veins. Furthermore, local pathologic processes, such as are confined to the hemispheres, may be responsible for local circulatory disturbances sufficient to cause a cessation of function of a large part of the forebrain without leading in any way to a corresponding implication of the medulla. When, however, the local process is in the near proximity of, or, if remote, when its effects are so far-reaching that the vital centers of the bulb are compromised, the one symptom which with regularity is called forth, and which betokens a serious alteration in the local circulation, is a persisting rise in blood-pressure, which may or may not be associated with a pronounced vagus pulse, with rhythmic alterations in blood-pressure and with a retardation of periodicities of the respiration approaching a Cheyne-Stokes type. The first and minor symptoms of compression are found in association with varying degrees of intracranial venous stasis, the major symptoms of 'Hirndruck,' with an approaching capillary anemia of the medulla."

A later contribution¹ from the same author on the same subject, which is called a sequel to the Mütter lecture, is summarized as follows: "Varying degrees of rapid increase in intracranial tension produce corresponding disturbances in the intracranial circulation. To these circulatory disturbances the symptoms of compression are solely due. The condition known as acute cerebral compression may be conveniently subdivided into 4 stages, dependent upon the degree of circulatory alteration which has been reached. Each of the stages has its own more or less characteristic symptom-complex. The major or underlying symptoms originate in the centers situated in the medulla, and are called out only when the degree of intracranial tension begins to approach the arterial tension so that anemia is threatened. A circulatory condition in the medulla which borders upon anemia has the effect of stimulating the vasomotor center. Thus, a rise in blood-pressure is occasioned which restores the local circulation. The extent of this rise may be taken as an indication of the degree of advancement of the compression. Beyond a certain point, however, this reaction cannot take place. The vasomotor center under these circumstances fails, and the respiratory efforts cease

¹ Am. Jour. Med. Sci., June, 1903.

entirely. In conjunction with other symptoms, a progressive increase in arterial pressure or a high degree of the same, which has been already reached, or a pressure which exhibits from moment to moment great alterations in level may be taken as a certain indication of the advisability of early operative intervention. In case there are localizable symptoms the site of trepanation is plainly indicated. In case of generalized compression from widespread hemorrhage when there are no localizing indications, the intracranial tension should be relieved by the elevation of a large osteoplastic flap from one hemisphere or the other with a corresponding opening in the dura."

Frederic S. Dennis¹ discusses the indications for operative interference in intracranial tension, illustrating his remarks with a number of cases. The former classification of concussion and compression of the brain is no longer sufficient. Concussion has to do with the fluid equilibrium and is usually of momentary duration. If it is severe, spasm of the vasomotor system occurs and the condition simulates surgical shock. Dennis has observed that the more highly the nervous system is developed, the more sensitive the patient is; and that the more highly the intellectual faculties are cultivated, the greater the concussion following head injury. Dennis refers to a unique case of a child who fell to the pavement from a third story, suffering an indented fracture of the parietal bone. The compression was sufficient to produce hemiplegia of the opposite side and deep coma. Dennis so manipulated the sides of the head as to cause the indentation entirely to disappear. As soon as the bone sprung back to its normal position the child passed at once from deep coma into complete consciousness and the hemiplegia instantly disappeared. Contusion is present in nearly every head injury to a greater or less degree. Laceration is an important etiologic factor in the production of intracranial tension. The hemorrhages are generally so profuse as to disorganize the brain tissue completely. Laceration may cause death in itself, whereas contusion produces death only secondarily, and then from inflammatory changes. Cerebral compression means the application of any force acting from without upon a part of or upon the entire brain. These forces may be in the form of blood, bone, pus, or a foreign body. Cerebral pressure, on the contrary, means the application of any force acting from within the brain, and is seen in cases of traumatic hydrocephalus, in diffuse meningitis, and in extravasations of blood in the subdural spaces, etc. Several interesting cases of cerebral pressure are described. In one of these cases the intracranial tension was so great that the clot, which was about the size of an English walnut, escaped from the ventricle through the opening made in the cortex, dura, and skull, and shot into the air some feet above the operating table. Intracranial hemorrhage is one of the most frequent causes of intracranial pressure. The indications in this condition are in some cases perfectly clear, while in others they are not sufficient to warrant intervention. Deep coma following a head injury calls for immediate operation. If the coma is not profound, but the symptoms of intracranial pressure are

¹ Med. News, March 21, 1903.

on the increase, trephining should be done. If coma is not present, if the blood-pressure is not increasing, if the leukocytes are not rising, if the red blood-cells are not increasing, if the urine is not becoming glycosuric, and if the cephalalgia is not increasing, operation is not indicated. If these symptoms having been stationary begin to increase, operation is called for.

H. P. Frost¹ makes a final report on a case of extensive head injury which for the past 40 years has interested the medical profession. The case is that of a man who at 23 years of age received an injury which tore from the skull the entire parietal and a portion of the squamous and frontal bones. These portions of bone were torn entirely free and shown to the physician when he first saw the patient. The case was first reported by Rutherford,² of Harrisburg, Pa. The patient was suffering but slightly from shock, he sat up while the wound was being dressed, and subsequently changed his clothes without assistance. His mind was clear and there were no symptoms of concussion. The wound suppurated extensively, but ultimately healed, and the patient returned to his work. The next report of the case was made in the "Buffalo Medical and Surgical Journal,"³ when the patient was in vigorous health and suffering no inconvenience from the injury except a sense of fullness in the head when he stooped or exerted himself actively. Further reports of the case were made by Gray⁴ and by Bergtold.⁵ In this last report the patient was described as suffering from a paralysis of the left leg and arm and right side of the face. This condition had begun with an unsteadiness of gait 26 years after the injury. Thirteen years after the development of the paralysis the patient came under Frost's care in the Buffalo State Hospital for the Insane. He was quite helpless and his mental faculties were markedly affected. These symptoms increased, and he finally died. At the autopsy the condition of the skull described by Rutherford was confirmed and a peculiar condition of degeneration of the brain was revealed. The superficial area of that region of the corona radiata supplied by the middle cerebral artery had degenerated and disappeared, while the cortex overlying this area, although eroded from beneath in some spots and shrunken considerably from its normal thickness, had continued to receive sufficient nourishment to maintain its particular integrity to an extent which prevented any indication of the degenerated condition on inspection of the surface. It is not believed that at the time of the injury the brain suffered a degree of laceration or contusion sufficient to set up an encephalitis and thus lead to this degeneration and loss of substance—the entire absence of all symptoms of such damage to the brain having been noted. Furthermore, the paralysis, if dependent upon a lesion produced at that time, would not have delayed its appearance for 26 years. Neither is a possible infection from the suppurating wound accepted as the cause of this condition. This would have declared itself clinically; it would not have spared the

¹ Am. Jour. of Insanity, April, 1903.

² Phila. M. and S. Reporter, Sept., 1857.

³ October, 1873.

⁴ Am. Jour. of Insanity, April, 1876.

⁵ Med. Press of Western New York, vol. iii, 1888.

cortex; it would have caused adhesion of the meninges; and, again, the hemiplegia resulting would have been manifest directly.

The **surgical treatment of hemorrhagic pachymeningitis** is dealt with by John C. Munro,¹ who reports 11 cases of this condition, 5 of which were operated upon and 1 of which recovered after operation. From a study of these cases the following conclusions are reached: "(1) Hemorrhagic pachymeningitis is found in the insane and in infants, but for the most part in men not insane after middle life. (2) Alcohol, syphilis, acute and wasting diseases, and trauma apparently bear some causative relation. (3) The symptoms are those of diffuse subdural hemorrhage, coming on slowly, producing mental irritation, spasm and rigidity of the extremities, convulsions, and, later, paralysis, the sequence being more or less irregular. (4) The cranial nerves are not liable to be affected. (5) The treatment is surgical, and should be instituted as early in the disease as possible. (6) Without operative relief in cases with pressure symptoms the prognosis is practically hopeless. Early operation is not serious and gives the best chance for recovery."

Roswell Park,² after an interesting discussion of the **surgical treatment of epilepsy**, reaches the following conclusions: "(1) Epilepsy is the last disease to which surgical measures should be indiscriminately applied. In judiciously selected cases, radical operations of various kinds, suited to the individual needs of each case, have given far more satisfactory results than has nonoperative or medicinal treatment. (2) Every case must be studied as a problem by itself. The only general laws applying are those regarding the removal of peripheral or local foci of irritation and the destruction of paths of conduction which convey disturbing impulses. In each case we must decide as to the operative method by which we may best meet these indications. (3) In order to attain the best results patients should be seen early. It would be well to have every epileptic carefully studied by an accomplished surgeon, who should review the case with a view to the possibility of surgical intervention. (4) Operation, when indicated and undertaken, should be regarded as a first measure to be followed, and often preceded, by others looking to a correction of all faults of diet, of elimination, etc. Long-continued attention to these matters is the price of eventual success. (5) In those cases characterized by blanching of the face, when seizures can be warded off or mitigated by prompt use of amyl nitrite, we may well consider the propriety of an exsection of the cervical sympathetic."

Schaefer³ describes a new **instrument to protect the brain while doing craniotomy**. The objection to the use of the Gigli saw is the danger of injuring the brain and its membranes. The instrument devised by the author consists of a flat, flexible strip of metal which is passed under the skull after the trephine openings are made, which acts as a shield to the structure beneath. The Gigli saw is drawn through on top of this shield by means of a section of watch-spring, which is passed under the skull with the protector.

¹ Chicago Med. Recorder, Dec., 1902.

² Amer. Med., Nov. 22, 1902.

³ Jour. Am. Med. Assoc., Jan. 24, 1903.

J. Chalmers DaCosta¹ describes the use of a **new trephine devised by Stellwagen for the purpose of making an osteoplastic resection of the skull.** In the case operated upon by DaCosta the instrument proved most satisfactory. The instrument is shown in the accompanying cut. In using the trephine the index-finger is hooked beneath the finger-guard on the bar, and not extended along the shaft of the instrument, which is the method employed in using the ordinary trephine. The manner of holding this instrument should be most particularly observed, as the success of the manipulation largely depends upon absolutely controlling, at the same time, the saw and the center-pin. By holding it correctly, the greatest amount of power is obtained with the least resistance and the slightest pressure; thus, the control and power of the instrument are much increased. Fig. 51 shows a knife for making the incision through the scalp and periosteum, which

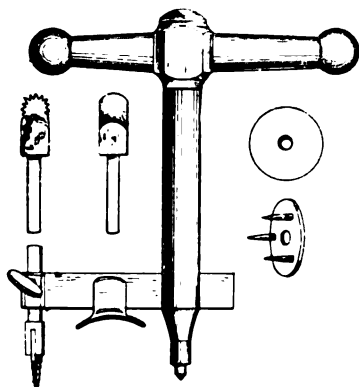


Fig. 51.—Stellwagen's trephine. Shows the saw, the plates, and the knife and also the instrument put together and ready for cutting the bone. (DaCosta, in *Ann. of Surg.*, July, 1902.)

device was suggested by W. J. Hearn. The employment of this knife shortens the time required to incise the flap and expose the bone, and it makes the scalp incision accurate; this is necessary when we are going to use a bone-cutter which moves with absolute accuracy. Furthermore, the consequent cicatrix is neater than when the incision has been made with a knife. It is difficult or impossible to make an absolutely circular cut with a knife. Even if we attempted to cut a half-circle, there would be irregularity and nicking of the edges. Fig. 51 also represents the saw, the diagram being of the actual size. A saw of this character and size has been found to be the most successful. This saw is easily kept in order, and can be readily sharpened. It must be thick enough to cut a fairly wide groove; must have long teeth, properly set, polished, and sharpened. A saw of the character shown in the cut will make the bone section without jamming or clogging with bone dust. The surgeon should have several saws of different lengths until he becomes accustomed to the use of the instrument. When the kerf is deep and the skull thick, a longer saw may be inserted. This would prevent sudden plunging of the blade into the dura. The shoulder, which is shown in the cut, will prevent such slipping. Fig. 51 also shows the plate, the pins of which pass through the scalp around the center of the circle selected for operation. When they engage the bone, a few light blows of the mallet will cause their entry into the skull." [Since the publication of this paper the instrument has been used a number of times by Hearn and by DaCosta. With additional experience the time required is shortened.

¹ *Ann. of Surg.*, July, 1902.

As a rule, a skull of ordinary thickness is cut through in from 8 to 10 minutes.]

Willard Bartlett¹ presents a contribution to the surgical anatomy of the middle cranial fossa, with special reference to operations for the removal of the gasserian ganglion. This article shows a careful study of the middle fossa and is illustrated by a number of cuts showing the variability of the course of the middle meningeal artery. It was the author's hope in undertaking this study to be able to formulate some rule for avoiding the middle meningeal artery in making the bone opening necessary for the removal of the gasserian ganglion. "This is, however, manifestly impossible in dealing with a structure which is so irregular that in 100 middle fossas it can hardly be said to follow identically the same course in any two. Not possessing an ideal routine, it is then next in importance that we realize the possibility of meeting the artery at almost any point in the temporal fossa—it may be lying upon the inner surface of the bone, embedded within the same, or, in rare instances, outside the protecting wall."

A complete review of the subject of **excision of the gasserian ganglion** is presented by Murphy and Néff.² The authors report briefly 10 cases operated upon by the **Hartley-Krause method**. After speaking of the anatomy of the fifth nerve, they discuss the pathology, etiology, symptomatology, and prognosis of tic douloureux. The pathologic changes are both varied and inconstant and range from slight irregularities in the size and shape of the nerve-cells and fibers to the grosser lesions, such as tumors, endarteritis of the vessels supplying the ganglion, and marked connective-tissue hyperplasia. Tumors are rare, Keen being able to find but two in addition to his own case. After enumerating the various causes of the conditions and mentioning its greater frequency in women than in men, the authors state that probably in the great majority of cases the disease process is ascending, beginning in the peripheral nerve-filaments and later progressing to and involving the ganglion. Heredity plays no part in the etiology. Without operation the condition goes from bad to worse, and finally becomes intolerable. Castor oil and strychnin are the remedies which accomplish the most good, but these at best afford only temporary relief. In the later stages mental derangement is not uncommon. Dana takes a more optimistic view of the prognosis than that just given. Removal of the ganglion in the great majority of cases effects an immediate and permanent cure. The authors present a résumé of the various operations devised for the relief of tic douloureux. Neurotomy was first suggested by Albinus and Galen, and was carried out on the infraorbital branch by Schlichting in 1748. Neurectomy was first performed by Abernethy in 1793. The removal of the gasserian ganglion was first recommended by J. Ewing Mears in 1884. It was first performed by William Rose, of London, in 1890. The authors minutely describe the Hartley-Krause operation and Cushing's operation. The most serious complication in the performance of intracranial operations is hemorrhage. This may arise from the

¹ Ann. of Surg., Nov., 1902.

² Jour. Am. Med. Assoc., Oct. 11 and 18, 1902

middle meningeal artery, from the *venæ Santorini*, and from the cavernous sinus. For venous hemorrhage the tampon is all-sufficient, whether the blood comes from the *venæ Santorini* or from the sinus. Tampons should not be used to control bleeding from the middle meningeal artery unless the tampon is inserted in the foramen and allowed to remain. When the artery runs in a canal in the bone, the canal wall can be readily compressed with a punch. When a tampon is employed to control this arterial bleeding and is not pushed into the foramen, it only serves to cover up the point of hemorrhage. The ligation of the external carotid is legitimate and rational in case of hemorrhage, but it is not thought necessary as a preliminary measure. The greatest trauma to the brain has been produced by tampons during and after operation. Sepsis is a complication which has occasionally arisen after operation. In one of the cases reported by the authors the patient died of septic meningitis. It is extremely rare for pain to recur after the removal of the ganglion. The mortality of the operation is about 15 %. The operation should always be considered a grave procedure. It is justifiable only when one of the following indications is present: (1) When all internal medication and the removal of external irritants have failed. (2) When all branches of the nerve are involved in the pain; here it should be a primary operation. (3) When individual branches only are involved and relief has not been secured by peripheral operation. (4) In cases in which formerly divisions at the base were indicated.

Frazier and Spiller¹ make a further report upon a case of *tic douloureux* treated by the division of the sensory root of the gasserian ganglion. (See YEAR-BOOK, 1903.) This patient was a man 68 years of age who was operated upon in October, 1901, and the case was soon afterward reported. The authors now state that the patient has remained entirely free from pain since the date of operation. The area of anesthesia remains the same as upon his discharge from the hospital. The cornea and conjunctiva on the affected side are completely anesthetic. The patient's mental condition shows marked improvement since the operation. The advantages claimed by the authors for this operation are the avoidance of hemorrhage or injury to adjacent structures, and reduction in the mortality-rate. Spiller repeats the statement that the possibility of regeneration of the sensory root after division is remote. The hope of avoiding ocular complications is one of the reasons for urging the division of the sensory root. The authors do not wish to claim more for the operation than is justified by the results of one successful case. Reference is made to a case of Keen's in which neither he nor Frazier were able to identify the motor root as distinguished from the sensory.

Subdural interposition of rubber tissue without removal of the gasserian ganglion in operations for *tic douloureux* is recommended by Robert Abbe.² The failures of the peripheral operations have driven surgeons into a field of operation of great danger and difficulty. In a recent article by Lexer, who is a strong advocate of the complete

¹ Phila. Med. Jour., Oct. 25, 1902.

² Ann. of Surg., Jan., 1903.

removal of the ganglion, it is said that out of 201 cases collected from the literature of the past 10 years, 83 % survived the operation and 77.6 %, or 156 of the 201, could be regarded as permanently cured. "Of the 33 cases of death, 17 died at the close of operation; 11 died of collapse without regaining consciousness, 7 of meningitis, 1 from infection from without, in which the patient tore off the bandages in delirium; 2 of brain tumor, 1 of brain-abscess, 1 of softening of the temporal lobe, 2 cases of postoperative pneumonia, 1 of heart-failure, 1 of hemorrhage, 1 of uremic coma. Three died without cause of death reported. In 2 cases, at death, brownish softening of the cortex of the temporal lobe was found, and in 1 of these edema of the pia mater. Moreover, he says, in other fatal cases temporal lobe injuries were found in addition." These statements show the gravity of the operation of removing the ganglion. Abbe reports a case in which 6 years ago he made 3 unsuccessful attempts to remove the gasserian ganglion, but in each instance was obliged to desist because of hemorrhage. At the third operation he was, however, able to remove a portion of the nerves at their origin from the gasserian ganglion and interpose between them and the ganglion a small sheet of sterile rubber tissue. The patient left the hospital in 3 weeks and has had no pain since. This was 6 years ago. In discussing the nature of tic he states that pathologically, except in cases of bony tumor or disease of the cranial bones like exostosis, he believes that the disease of the nerve is always located anterior to the gasserian ganglion. Considering the ability of resected nerves to regenerate, it is thought reasonable to suppose that in the case reported the rubber tissue which was used has maintained its integrity and prevented nerve regeneration. Abbe has used the same method of procedure in 4 other cases, and states that the results have been perfect. One of these patients has been well for 5 years, one for 2½ years, one for 21 months, and one for 6 months. He refers to another case in which he did the Salzer operation, 4½ years ago. Anterior to the skull he laid a piece of rubber tissue over the resected nerve-ends in the sphenomaxillary fossa. This patient also remains perfectly well. The technic of the operation is described as follows: "The external carotid artery may be ligated with advantage in controlling hemorrhage. A vertical incision over the middle of the zygoma carried through the temporal muscle to the bone divides no important nerve or vessels. The muscle is scraped to either side and held by retractors. A small opening is then quickly made by mallet and gouge, and this is enlarged rapidly and safely to 1½ inches diameter. No better exposure can be had by any incision than this simple straight one. The dura is then pressed away from the middle fossa until the nerves are exposed. The much complained of hemorrhage from venous sinuses on dissecting up the perosteum can be best controlled, and very quickly, by pressing a strip of rubber tissue upon the place with a firm pad of gauze in strips. The clotting of blood under the rubber tissue takes place very quickly, while if plain gauze is put in contact with the bleeding point, the blood being sucked up into it, prevents clotting. The nerve-trunks I grasp in separate

artery clamps, divide each close to the foramen of exit, and, either by cutting or by rotation of the forceps, separate them from the gasserian ganglion. The wound is packed for a few moments with narrow strips of iodoform gauze until dry. A piece of thin gutta-percha tissue, stiff enough to be easily handled, is sterilized by rubbing with mercuric chlorid solution, and kept in salt solution for a few moments before operating. This is cut $1\frac{1}{2}$ inches long and $\frac{3}{4}$ of an inch wide. This is laid carefully over both the foramen rotundum and ovale, where the nerves have been separated, and pressed carefully into place by iodoform gauze. In a very few moments the gauze may be drawn away and the gasserian ganglion allowed to settle down upon the rubber tissue. A small drainage-tube should be placed in the angle of the wound for a few hours to insure a perfectly dry healing." All agree that there is no need for the removal of the first division of the ganglion in any case of grave tic douloureux unless the pain is due to the existence of a tumor in or by the gasserian ganglion or behind it.

C. A. and H. A. Ballance and Purves Stewart¹ present their experience in the **surgical treatment of intractable facial paralysis**. The authors maintain that the regeneration of peripheral nerves takes place from the peripheral stump of the divided nerve as well as from the proximal end, and therefore it is maintained that to unite the peripheral portion of a facial nerve which has been damaged to another nerve, such as the musculospiral or hypoglossal, is a reasonable procedure. They have done a large amount of experimental work in this connection, and are convinced that in cases of facial palsy which do not respond to treatment, and in which the survival of muscular fibers on the paralyzed side of the face is determined by electricity, the operation of nerve anastomosis is the treatment which should be instituted. In all but one instance the nerve which was anastomosed with the distal portion of the injured facial nerve was the spinal accessory. In the exceptional case the hypoglossal nerve was chosen, and it is this nerve which the authors believe to be best suited for the purpose. One of the disadvantages of uniting the spinal accessory to the facial nerve is the subsequent association of facial and shoulder movements. The centers for the face and for the tongue, however, are closely associated in the cerebral cortex, and it is thought that the results of this anastomosis will prove more satisfactory. In none of their cases in which the spinal accessory was used were the facial movements unassociated with some movement of the trapezius and sternomastoid. Those cases are suitable for operation in which the paralysis has lasted so long that recovery cannot be expected without operation. Nerves which have suffered from infective neuritis give a less favorable prognosis than traumatic cases.

A review of the surgical treatment of **facial paralysis by nerve anastomosis** is presented by Cushing,² who also reports an interesting case. Faure, acting upon a suggestion of Furet in 1898, was the first to attempt an anastomosis between the peripheral end of the facial nerve and that portion of the spinal accessory which supplies the

¹ Brit. Med. Jour., May 2, 1903.

² Ann. of Surg., May, 1903.

trapezius muscle. The operation failed. Numerous experiments upon the lower animals have been performed by a number of investigators, among them Manasse, of Berlin, and Barrago-Ciarella, Naples. Robert Kennedy, of Glasgow, was the first to successfully carry out anastomosis between the facial and spinal accessory nerve. In this case the facial nerve was divided for the relief of severe facial spasm and the anastomosis was immediately performed. The spinal accessory nerve was only incompletely severed at the point of anastomosis. His postoperative observation on this case demonstrated that the spinal accessory alone ultimately served as a path for transmission of impulses to both motor territories. When he operated upon the case reported, Cushing had no knowledge of the previous work of either Faure or Kennedy. The case reported is that of a young man, 30 years of age, who some hours previous to admission received a bullet-wound from a 38-caliber pistol held close to the skull and discharged just behind the right ear. There was at this time complete paralysis of the right side of the face. At no time was there unconsciousness or other evidence of intracranial injury. The bullet was removed from the bone, its tract cleaned and allowed to heal. The patient suffered from facial palsy. Cushing did not attempt operation until the postauricular wound had entirely closed, because he was afraid that the unhealed wound might be the means of infecting the one which he proposed to make. Six weeks later under ether anesthesia Cushing made an incision and the spinal accessory was readily located and exposed at its point of entrance into the sternocleidomastoid muscle. The nerve at this point consisted of one trunk and was not split in two portions, as is often the case. The facial nerve was exposed by incising the posterior border of the parotid gland, the incision running in the same direction as the skin-wound. Before operating on this case, Cushing performed a number of anastomoses upon the cadaver and found that the facial nerve was most easily exposed by incising the gland rather than by searching for the main trunk posterior to the gland. Having located the two main branches in the gland, these can be traced back very readily to the main trunk. The nerve was divided as near as possible to the scar tissues at the side of the stylomastoid foramen. The spinal accessory was divided close to its point of entry into the muscle; both nerves were then freed far enough to enable them to be brought together over the posterior belly of the digastric muscle. The sheaths of the nerve-stumps were sutured together at three points by means of fine curved intestinal needles threaded with the most delicate strands of split silk. The first improvement noticed was on the day after the operation, when the patient announced that he was no longer troubled with lachrymation and that he could read without the annoyance of an overflow of tears. He was also less troubled with a flow of saliva and could more easily dislodge food from his flaccid cheek. Cushing has no explanation to give of these early assurances of improvement. On the tenth day the man returned to his home with a small galvanic battery, to the use of which is attributed a large part of his subsequent improvement. Thirteen days after the operation the man was able to eat with a fork without

soiling, and his face when at rest was less asymmetric. There was marked improvement 81 days after the operation. When the patient's face was at rest, the asymmetry was hardly noticeable. The following is the note made 207 days after the operation: "Considerable improvement appreciable, though the patient has entirely neglected exercises during the past month. Coordination of individual movements of expression better, without calling other muscles into play. It is still impossible to move the head to left (action of *M. sternocleidomastoideus*) or to elevate the shoulder without calling facial muscles into action. In case of shoulder elevation, however, the face can subsequently be almost completely relaxed." The electric reactions were found to be practically normal to faradic and galvanic stimulation, whether applied directly to the muscles or indirectly through the nerves, 287 days after operation. In discussing this operation Cushing states that had he been aware of the previous operations of Faure and Kennedy he might have attempted likewise to preserve a portion of nerve-supply to the sternomastoid and trapezius muscles. He, however, states that "at present, with the knowledge of Faure's failure and of the more pronounced associated shoulder and facial movements which persisted in Kennedy's case, it seems possible that the complete division of the nerve and abandonment of the *M. cucullaris* and *M. mastoideus* may be the better plan." The success of the procedure depends largely upon the delicacy with which the nerves are handled, upon their accurate approximation with the least possible suture material, and that placed only in the nerve-sheath, upon absolute hemostasis, and upon the care with which the tissues covering the wound are handled, since it is of the utmost importance that there should be a minimum of cicatricial formation. It can be readily understood that this operation is especially well suited to those cases in which there is a lesion of the facial proximal to the stylomastoid foramen. The time which may elapse after the reception of an injury to a motor nerve and still allow of restoration of function through nerve anastomosis is necessarily uncertain and dependent entirely upon the condition in which the muscles have been kept by massage and the use of the electricity. When the muscles have, however, become so atrophied as not to respond to galvanic stimulation, probably no hope can be entertained of recovery. Regarding the course of the nerve impulses in this case, Cushing offers the following conjectures: "(1) That the cortical centers concerned in shoulder movements (*trapezius*) and rotation of the head (*sternocleidomastoid*) may themselves in the course of time be educated by training to coordinate the impulses, which have been side-tracked into the motor area of the facial nerve, so as ultimately to lead to expressional movement. (2) That the cortical centers originally presiding over movements of the face continue to play a part in the coordinate action of these muscles, possibly influencing the higher neurones of the *N. accessorius* through the intermediation of connecting tracts in the cortex." [This article is profusely illustrated with photographs showing the gradual improvement of the patient and the action of the different muscles.]

Cotton and Allen¹ report 4 cases of **brachial paralysis following the administration of an anesthetic**. Each of the cases was quite difficult. The arms had been fixed over the head, the palsy was complete or nearly so, and gradually disappeared. The authors have been able to collect 30 cases of this condition. They have excluded from consideration cases of paralysis having a central or reflex origin or those evidently due to direct pressure on the peripheral nerve-trunks, such as pressure of the table-edge on the musculospiral nerve. Emphasis is laid upon the following points: "Paralysis of part or all the muscles supplied by the brachial plexus with some sensory involvement is not very uncommon after narcosis, though rarely mentioned. Its cause is not toxic but mechanical. It occurs only when the arms are long held above the head or lie in abduction—never if they lie flexed on the chest. The mechanism is a pressure on the nerve-roots, probably between the clavicle and the muscles over the transverse processes of the cervical vertebrae, or from stretching over the head of the humerus in abduction. The trouble is essentially functional without known lesions. The lost function returns in part very early. Total recovery is often long delayed, but apparently is to be counted on. The possibility of the accident should be impressed on students, on house officers, and on all of us. In view of this risk the arms of a patient under ether should always, where possible, be flexed with the hands on the chest. If other positions are unavoidable they should not be continued long without change."

Robert Kennedy² deals with the **surgical treatment of birth paralysis of the upper extremity**, what is known as **Duchenne's palsy**, and reports 4 cases, in 3 of which he has operated. In all of these cases the muscles affected were identical—the deltoid, the infraspinatus, the biceps, and the brachialis anticus. With one exception the electric reactions in the muscles were abolished and the cutaneous sensation normal. The palsy results from traumatism during delivery and is usually caused by forcible depression of the shoulder while the head is bent to the opposite side and rotated. The palsy is evident as soon as the child is born. Many cases recover with or without treatment; others make partial recoveries after the lapse of a year or more; and many cases show no improvement. Recovery may be complete if there is nothing to prevent the reunion of the nerves; but if there is cicatrization in the neighborhood as the result of the injury, the union will not be complete and some palsy will always remain. Nothing should be done immediately for the relief of the condition, but when the child is about 2 months of age the electric reactions of the muscles should be tested. If the muscles respond to the faradic current the case ought to be left for a further period and the contractions be tested again. If they still show improvement, the patient may be expected to recover without operation. If, however, after 2 months no response can be got in the muscles with the faradic current, although the galvanic current evokes vigorous contraction, it is safer to proceed with the operation than to put it off in the hope that recovery will take place later. The brachial

¹ Boston M. and S. Jour., May 7, 1903.

² Brit. Med. Jour., Feb. 7, 1903.

plexus is exposed through an incision extending along the outer border of the sternal mastoid, from the middle and lower thirds to the juncture of the outer and middle thirds of the clavicle. Stress is laid upon the necessity of resecting all cicatricial tissue, even though considerable portions of both nerve-ends are sacrificed. The fifth and sixth nerves are divided proximally and the suprascapular nerve and the branch to the outer cord and branch to the posterior cord distally. The division should be made through healthy nerve tissue. The three peripheral ends are then sutured to the two central ends by means of a single thread of fine chromicized catgut passed through the entire thickness of the nerve. The shoulder should be raised and the head turned to the affected side, in order to permit suturing, and fixed in this position so that the sutures will not be put on the stretch. The dressing should be kept in place for 12 days. In but 1 of the 3 cases operated upon has sufficient time elapsed for recovery to be well advanced. The improvement in this case has been most satisfactory. Sufficient time has elapsed in the others for some commencing restoration of movements. One of the patients operated upon was 14 years of age, and in this case it is not expected that the outcome will be very satisfactory.

Henricksen,¹ in an article on **nerve-suture and nerve-regeneration**, reports in detail a number of interesting experiments. Among other conclusions the author claims that only after a lapse of some time will a nerve lose its motor conductivity when divided. Regeneration begins immediately after the division of the nerve and occurs together with degeneration, so that, after a short interval (7 days), long threads are found that ultimately develop into active nerve-fibers. In the rabbit, after the thirtieth day, an advanced development of the myelin sheath is found in the newly formed fibers of the peripheral part, and at the same time motor power may be observed, and later an increase in muscle weight. After some time has elapsed there is found electric reaction. The further from the periphery a nerve is injured, the longer the time before the affection of motor power and the slower the recovery. This is not evidence, however, that the nerve is growing from the central end. Experiments on animals show that a divided nerve unites equally rapidly whether sutured or not, therefore suture is not always necessary, but it should not be omitted, as conditions sometimes arise which prevent the union and function of the nerve; for instance, infection leading to the formation of dense scar tissue. If union of the nerve has not taken place or is incomplete, examination of sensation will determine when interference is necessary. The time that may elapse before an operation, with the risk of slow and perhaps incomplete recovery, is scarcely more than a month. The nerve-fibers grow with most activity in the first few weeks and the recovery of sensation will rapidly succeed union. If sensation does not return or is incomplete or is progressing slowly at the time of the formation of scar tissue, it must be considered as an indication that serious obstacles to nerve union are present and that entire recovery cannot be expected without operation. Sensation, there-

¹ Lancet, April 18, 1903.

fore, is of the greatest importance in diagnosis and prognosis. Both in primary and secondary nerve suture the kind of suture material used and the way in which the suture is introduced are minor matters, an aseptic operation being the essential consideration. In secondary suture it is of the utmost importance that all scar tissue and the outer portion of the nerve-ends be removed.

Moyer¹ reaches the following conclusions, after dealing with the surgical relations of traumatism of the peripheral nerves: "(1) Section or laceration of a nerve, if of some size, is usually recognized at the first examination. (2) Contusions of nerves are common, the symptoms often being latent until neuritis develops; the latter may be delayed some days. (3) Contusion of a nerve may complicate any fracture or dislocation, but is especially frequent in dislocations of the shoulder. (4) Injury to the circumflex nerve merits special mention because of its frequency, the ease with which it is overlooked, and its serious consequences. (5) The reflex paralysis after joint injury is probably due to a traumatic neuritis. (6) The management of the joint, tendon, and muscular complications comprises in the main the treatment of traumatic neuritis."

Bowlby² states that **primary nerve-suture** should always be employed when it is possible to do so, and the chief cause of its failure is sepsis. In performing secondary suture it is well to remember that the nerve can be most easily found above and below the scar; therefore, free incision should be made. After free exposure of the nerve it should be separated from the scar tissue, its ends freshened and brought together by suture. In cases in which the nerves have been divided for a great length of time, the lower end is often shrunk and much smaller than normal. Nerves will stand considerable tension; this tension, however, should be relieved by flexing the part. The sooner the nerve-suture is inserted, the greater the chance of benefit. The restoration of sensation and motion after nerve-suture is most irregular in its appearance; sensation usually appears first. The function of some nerves seemed to be more easily restored than that of others; for instance, better results are obtained from suture of the perineal and musculospiral nerves than are obtained after suture of the median and ulnar. It is seldom or never possible to restore the function of the part absolutely. When nerves are partially divided, operation is indicated according to the amount of division, and this can be estimated by the muscles involved. Cases of partial division tend to spontaneous union. Bowlby refers to a number of interesting cases of contusions of nerves in which absolute palsy resulted and remained for varying periods. In such cases it is not considered wise to attempt any operation. It is proper to employ massage, galvanism, and use of the part. There has been no case of nerve-suture reported in which motor power has been restored after an interval of 4 years.

Bloodgood³ reports 3 cases of **angioneurotic erythema**, in one of

¹ Jour. Am. Med. Assoc., Oct. 25, 1903.

² Lancet, July 26, 1902.

³ Johns Hopkins Hosp. Bull., May, 1903.

which the condition was relieved* by division of the nerve supplying the part. This case was one of angioneurotic edema of both cheeks secondary to drainage of the antral cavities. The condition was relieved by neurectomy of the infraorbital nerve. A second area developed on the left side of the abdomen and was relieved by the division of the intercostal nerves. A third area in the lower abdominal zone is still under observation. In the second case the condition was confined to the region over the mastoid. An exploratory incision was made under local anesthesia for the purpose of excluding disease of the bone itself. The patient was free from pain and erythema for about 3 weeks. Since the operation there have been intermittent attacks. The third case was one of angioneurotic edema of the elbow-joint.

DISEASES OF THE MUSCLES, FASCIA, ETC.

F. B. Lund,¹ of Boston, calls attention to the **iliopsoas bursa and its surgical importance**, reporting briefly 3 cases of inflammation of this bursa in which he has operated. The first case was one of iliopsoas bursitis complicating osteoarthritis of the hip. The symptoms were spasmodic pain and fluctuating tumor elevating the femoral artery. The condition was diagnosed as a deep abscess in front of the hip-joint and was incised. The evacuation of the bursa gave relief of pain and disability. The second case was one of gonorrheal arthritis complicated by iliopsoas bursitis; incision and drainage of the bursa and joint; immediate relief of symptoms and gradual recovery. The third case was one of iliopsoas bursitis due to suppurative arthritis of the hip; incision was followed by death from septicemia. The author's conclusions are as follows: "(1) The iliopsoas bursa possesses surgical importance, owing to its position and its frequent connection with the hip-joint. It frequently extends above the pelvic brim. (2) It may be involved in osteoarthritis, gonorrheal infection or suppurative arthritis of the joint, and the symptoms due to the disease of the bursa may dominate the clinical picture. (3) In gonorrheal arthritis incision of the bursa affords an easy method for reaching and draining the joint. (4) In osteoarthritis relief of pain is afforded by incision of the bursa. (5) The bursa is best reached by a vertical incision just below Poupart's ligament, between the anterior crural nerve and the femoral artery. The iliopsoas muscle may be drawn inward, or, as is perhaps more direct and preferable, the fibers may be separated by blunt dissection in the line of the incision. (6) When the bursa is connected with the joint a ready diagnosis of the condition of the head of the femur and acetabulum may be made by passing the finger through the opening in the bottom of the bursa. (7) Iliopsoas bursitis should be more often considered in the differential diagnosis of obscure tumors in the groin, and such a diagnosis should be possible in cases in which the hip-joint is known to be diseased and a tumor suddenly appears in front of the joint, under the anterior crural

¹ Boston M. and S. Jour., Sept. 25, 1902.

nerve and femoral vessels, which is very painful and tender, and perhaps gives to the palpating finger a sensation of deep fluctuation."

Féré¹ suggests **heredity as a cause of synovial ganglions**. He refers to a case of a woman who had synovial ganglions on both hands and who transmitted the tendency to 7 out of 17 descendants extending through 3 generations. In each case there was some slight traumatism which acted as an exciting cause of the condition. This synovial tendency, Féré suggests, may correspond to the weakness of aponeuroses which has been often observed in individuals belonging to neuropathic families.

Certain principles and methods in the surgery of the paralyses of children are discussed by Jones,² who states that operation in order to be successful must be followed by prolonged, intelligent, and careful after-treatment. No half-hearted surgeon with want of faith in the treatment can accomplish much. To operate upon these patients and neglect their after-treatment would be comparable to a physician making a diagnosis and leaving the treatment to the druggist. The mechanical after-treatment is inseparable from the operative treatment, and the surgeon who is not a mechanic is little better than the old orthopedic surgeon who worked entirely with mechanical appliances. Jones lays stress upon the prevention of deformity in acute infantile paralysis. The deformity which results in these cases is as much due to posture as to the antagonistic and unparalyzed muscles. Too much attention has been paid to the pathologic and not enough to the clinical aspect of this condition. Because certain groups of muscles have barely responded to stimulation and have remained inactive, it is too often assumed that this is due to cell destruction in the motor area. If this were true, whatever the surgeon might do would be futile. Cell destruction is not so extensive as would appear, and in the majority of cases is transient. Two cases are reported to show the error of mistaking muscles which were powerless from desuetude for muscles paralyzed from cell destruction. For instance, in one case the whole arm was paralyzed. The flexors first recovered and later the extensors. The flexors, having first regained their function, overpowered the extensors and, aided by gravity, became shortened or contracted, while the extensors were lengthened. The muscles thus placed at a disadvantage had become practically impotent from desuetude. The method of testing whether treatment will be of avail in these cases is to make the supposedly paralyzed muscles as tense as possible and then ask the patient to move them. If he succeeds ever so little, a favorable prognosis may be given. If he fails, treatment will be of no avail. The treatment consists in slowly stretching and lengthening the flexors and placing the extensors in such a position that structural shortening will ensue. We should not attempt to treat a weakened set of muscles without first rescuing them from a condition in which they are overstretched. Restoration of elongated muscles takes place by maintaining them in a slackened posture. Stress is laid upon the importance of not confusing muscles which for years have been

¹ Rev. de Chir., No. 10, 1902.

² Lancet, Feb. 14, 1903.

useless, with muscles which are positively paralyzed. It is this confusion which hinders both physician and surgeon in accurately gauging the potentialities of recovery. Jones next speaks of tendon transplantation and refers to excellent results which he has obtained in an experience of over 50 operations in cases of this character. Arthrodesis is recommended in paralytic joints which are either hopelessly flail-like or sufficiently so to demand unceasing mechanical attention. In this operation the part is put in the most useful position, the articular cartilages are removed, and the joint is allowed to become permanently ankylosed. In discussing cerebroparalysis of the spastic type, Jones states that cerebral diplegia is by far the most serious condition met. The treatment of spastic paralysis has been too long solely in the hands of the physician, since many of these patients may be improved in both body and mind by surgical efforts, and frequently may be enabled to walk with comparatively little difficulty. Beyond remedial art are to be placed the idiot, the microcephalic, and that violently irritable type of diplegia subject to fits and active athetotic moments who has generally lost all control over his secretions. In most cases treatment may be required for two years, and if the patient cannot be under observation for that length of time the treatment will accomplish little, since it divides itself into operative and postoperative. If the paralysis is complete, that is, if the patient is never known to relax spasm, the treatment is futile. Tenotomy in these cases is of great value, but unassociated with careful after-treatment is disappointing.

DISEASES OF THE SPINE.

A. R. Small¹ reports a case of **spina bifida without a sac**. At the end of a week granulations had covered the spinal cord.

P. Tytler and R. T. Williamson² report a case of **compression myelitis from hydatid cysts**. There was complete paralysis of both legs, anesthesia of both legs and the lower half of the trunk, and complete paralysis of the bladder and rectum. Laminectomy was performed and 15 extradural hydatid cysts removed from the thoracic portion of the spinal canal. The patient gradually recovered the sensation which had been lost and the control over bladder and rectum. Two and one-half years after operation the patient is able to walk with the aid of a cane, but the limbs are still spastic.

Putnam, Krauss, and Park³ report a case of **sarcoma of the third cervical segment** in which excision of the growth was followed by recovery. The patient was a male, aged 45. Below the clavicles all sensation was lost. The left arm and leg were paralyzed, but slight motion remained on the right side. The left pupil was smaller than the right, but both reacted to light. All the reflexes were exaggerated and there was loss of control over the bladder and rectum. Ten weeks after

¹ Chicago Med. Recorder, Feb. 15, 1903.

² Brit. Med. Jour., Feb. 7, 1903.

³ Am. Jour. Med. Sci., Jan., 1903.

operation motion but not sensation had returned on the right side, and sensation but not motion on the left.

Henschen and Lennander¹ report the successful removal of a **sarcoma of the cervical portion of the spinal cord**. The patient was a man aged 59 years who progressively lost power in the lower limbs and sensation over most of the body, including the arms. The upper end of the tumor corresponded to the fifth cervical vertebra. Eight months after operation the patient was able to walk.

Joseph Collins² gives abstracts of 70 cases of spinal cord tumor collected from the literature of the last 6 years. Surgical operation was undertaken in 30 instances. The results of operation in these 30 cases were as follows: Successful in 12, partially successful in 8, and wholly unsuccessful in 10. The operation was considered successful when there was cessation of pain and recovery of motor power, partially successful when there was relief from pain, cessation of progress of the case, and slight restoration of motor power; unsuccessful when followed by death in a few weeks. The nature of the tumor is not stated in all the cases, but so far as could be determined there were 6 fibromas, 12 sarcomas, 3 endotheliomas, and 1 myolipoma. The cause of death as given in 9 cases was sepsis in 4, collapse and exhaustion in 2, shock and hemorrhage in 2, and pneumonia in 1 case. Spinal tumors are twice as frequently operable as brain tumors, and the results of operation are twice as successful.

DISEASES OF THE KIDNEYS AND URETERS.

Ramon Guiteras³ formulates the following principles as guides to the **diagnosis of surgical diseases accompanied by pyuria**: "(1) Given a case of pyuria, the seat and the nature of the lesion should be determined by all the methods at our command before an exploratory incision or an operative procedure is attempted. These methods include, in addition to the general and physical examination: (a) Examination of the urine, including cryoscopy and the phloridzin test; (b) cystoscopy; (c) ureteral catheterization; (d) segregation of the urine from each kidney by appliances introduced into the bladder and not into the ureters; (e) radioscopy. (2) The examination of the patient's urine in such cases should be considered as of the utmost importance and should be entrusted only to men thoroughly trained in this line of work, particularly in the microscopy of urinary sediments. (3) It is possible, by a careful study of the pus, blood, casts, and particularly by a study of the epithelial elements of the urinary sediment, to determine the nature of the lesions and the seat thereof in the urinary tract. (4) A renal lesion of suppurative character being found, it becomes necessary to locate it in one or the other kidney, or to determine whether the opposite kidney is present and healthy. This may be done with the aid of cystoscopy, ureteral catheterization, combined with the phloridzin test, and followed

¹ Mittheil. a. d. Grenzgebiet. d. Med. u. Chir., Bd. x, Heft 15, 1902.

² Med. Rec., Dec. 6, 1902.

³ Med. Rec., Nov. 8, 1902.

by the examination of the urines from each kidney; with the aid of the Röntgen rays, and, if need be, in case of doubt, of exploratory incision. (5) An omission of one or more links in the chain of methods of examination here enumerated may give rise to grave errors in diagnosis, and nephrectomy is never justified when we are not in the position to say that the opposite kidney is present and in good condition on the basis of the tests herein mentioned."

Peter Peterson¹ reports a case of **nephrectomy for carcinoma** in which he employed a lateral extraperitoneal incision. "An incision was made on the left side extending from the tenth costal cartilage to a point an inch internal to the anterior superior iliac spine. All the structures down to, but excluding, the peritoneum were divided in this line. The serous membrane was then reflected from the abdominal walls till the whole of the anterior surface of the kidney and a considerable part of the renal vessels were exposed. The advantages of this method far outweigh its disadvantages. The organ is easily accessible; there is no stretching of, or tension on, the vessels; large tumors can be removed through the wound; while the ureter, if necessary, can be exposed almost down to the bladder. The intestines do not come into the field of operation, the blood-supply of the colon is not interfered with, and the shock consequent on opening the abdominal cavity is obviated, while the wound is not any deeper than in the transperitoneal method. In the case of stone the viscus can be thoroughly examined between the fingers. In septic conditions the peritoneal cavity is not infected. Adhesions, both anteriorly and posteriorly, are easily reached, while in those cases in which the peritoneum is so adherent to the kidney that it cannot be stripped off and the abdominal cavity has to be opened this part of the operation is much easier than by the lumbar incision and is not any more difficult than by the abdominal route. The disadvantages are: (1) that the opposite kidney cannot be examined through the wound and (2) that a risk of ventral hernia is incurred; but in the case of wounds taking an aseptic course the latter objection is more theoretic than real."

J. A. Schmitt² formulates the following conclusions from a study of the literature of the **surgical treatment of Bright's disease**: "(1) In acute infectious diseases anuria with uremic symptoms threatening the life of the patient can be successfully combated by capsular incision or renal cleavage, which relieves congestive swelling and excess of intrarenal pressure. Operation on one side is sufficient to bring about an abundant urinary secretion, followed by a subsidence of the alarming general features. Whether the other kidney gains time to recuperate and re-assume its function, or whether reflex action plays a predominant role, are debatable points. At all events nature seems to get along with a small portion of functioning kidney tissue. (2) Anuria with uremic symptoms, occurring in the course of chronic Bright's disease, has afforded an occasion for surgical procedure. To recognize such an indication on reasons which are analogous to those above mentioned is, of course, a matter of individual judgment. Temporary relief, in some instances,

¹ Lancet, March 14, 1903.

² Med. Rec., Sept. 13, 1902.

has been gained—a permanent cure, however, has never been effected. (3) When the kidney has been operated upon directly for the cure of chronic Bright's disease the outcome has been a failure. The apparent benefit manifested in the disappearance of dropsy, dyspnea, etc., occurs just as regularly in the ordinary course of the treatment by medication and capillary drainage or puncture. (4) In exceptional cases colicky pains and hematuria are caused by chronic Bright's disease. Capsular incision or cleavage of that kidney to which the disturbances were traceable has been attended by excellent results; there can be no doubt that, when medical expedients have failed, surgical interference has succeeded in checking the hemorrhages and alleviating the pains, but it does not inhibit the progress of chronic Bright's disease. (5) Nephropexy may cure the ailments incident to movable kidney; it may remove albuminuria, if this be the result of local irritation, consequent upon the displacement; if, however, the movable kidney is affected by chronic Bright's disease, this affliction will remain uninfluenced by operation."

George M. Edebohls¹ analyzes 51 cases of **renal decapsulation for chronic nephritis** which he has performed up to date. Twenty-nine were in females and 22 in males. With the exception of a girl of 4½ years, all the patients were adults. The length of time intervening between the first recognition of disease and operation in 41 patients varied between 1 month and 19 years, the average duration being 3 years and 4 months. Many of the cases were complicated by circulatory and pulmonary disorders. Twenty-nine had chronic interstitial nephritis, 14 had chronic diffuse nephritis, and 8 had chronic parenchymatous nephritis. In all cases of chronic diffuse and chronic parenchymatous nephritis both kidneys were affected. In the 29 cases of chronic interstitial nephritis the disease was limited to one kidney in 9 instances. "There were 47 operations upon both kidneys and 4 operations on one kidney only; 7 patients died within 17 days after operation; 7 patients died at periods after operation varying between 2 months and 8 years, the average period of life after operation being 20 months; 2 patients do not show improvement satisfactory in every respect; 22 patients are in various stages of satisfactory improvement and progress toward health at periods varying between 2 months and 15 months after operation. The urine of several of these is at present free from albumin and casts. They have not, however, passed the probationary period of 6 months of normal urine, before the expiration of which no patient is entitled to a place on the list of cures. One patient, after a cure extending over a period of 4 years, again has chronic Bright's disease. One of her kidneys only was operated upon. Nine patients were cured of chronic Bright's disease and remain cured at periods after operation varying from 21 months to 10 years, the average duration of cure being over 4 years. Three patients disappeared from observation after leaving hospital, and no trace of them can be found." A rest in bed for a few days is advisable by way of preparation for each case. There are 3 conditions which may make renal decapsulation a difficult

¹ Med. Rec., March 28, 1903.

operation. The first is great length and coliquity of the twelfth rib, with narrowness of the space between the last rib and the ilium; this difficulty may be largely overcome by placing the subject in a proper posture and by making an oblique incision. The second difficulty is that the kidney is fixed well up under the ribs. The procedure under these circumstances is to incise the capsule proper at any portion of the kidney surface that can be reached, to seize the edges of the capsule with forceps, and to complete the separation of the capsule with the finger in the depths of the wound. As the kidney tissue is liable to become friable during the progress of chronic inflammation, great caution should be exercised in order to avoid the danger of tearing or fracturing the organ. The danger from the anesthetic is greater than is that of the actual operation. One hour should be the limit of time allowed for the decapsulation of both kidneys. Ether is a satisfactory anesthetic. In all but one case the wounds were completely closed, and primary union was obtained. A certain degree of cardiac degeneration accompanies every case of chronic nephritis, and if uncomplicated is not a contraindication to operation. When, however, the cardiac and vascular changes have advanced far and have become widespread so that improvement is out of the question, it is not worth while to take the risks of operation. The first effect of the operation upon the urine is shown in an increased daily output of urea. Of the casts present before operation, those which denote advanced destruction of the secreting structures of the kidney disappear first from the urine, such disappearance usually requiring from a month to a year. The albumin persists in the urine for a greater or less time after the permanent disappearance of all casts. Chronic Bright's disease, before irreparable damage has been inflicted on the kidneys, the heart, the bloodvessels, and the nervous system, is curable or susceptible of amelioration by renal decapsulation. Renal decapsulation in the early stages of chronic nephritis is, in competent hands, attended with little or no risk to life.

"From a study of 17 cases which he has operated on for various forms of chronic nephritis, Rovsing¹ formulates some rules as to the proper treatment in such cases. He divides the cases into aseptic and infectious nephritis. In the aseptic cases he found that diffuse parenchymatous nephritis was not influenced by operation. A case which he classed as chronic glomerulonephritis recovered after operation, he believes, more from rest in bed than from any favorable result from the operation. In diffuse hemorrhagic nephritis there is much danger in operating and the results are not satisfactory. In 4 cases of interstitial nephritis and perinephritis fibrosa occurring with uric acid and oxalic acid diatheses his results were satisfactory. Operation is frequently undertaken with a diagnosis of stone in the kidney in such cases and gives relief without any stone being found. The severe pains which are present in these conditions he believes indicate operation. Pain always indicates tension within the kidney capsule, it does not matter what form of nephritis exists. But the most important group of cases is that caused

¹ Mittheilungen aus den Grenzgebieten der Med. u. Chir., 1902, vol. x, p. 288.

by some form of infection. Eight of his cases were of this character and the condition was discovered only after most painstaking examination. Urine obtained under aseptic precautions should be accurately examined chemically, microscopically, and bacteriologically in every case, whether we suspect that we have to deal with an infection or not. In case pathologic constituents are found, cystoscopy and catheterization of the ureters should be employed. In his cases Rovsing found infections of the urine from *Staphylococcus aureus*, *Staphylococcus albus*, *Streptococcus pyogenes*, and *Bacterium coli*. The entire clinical picture did not differ in these cases from that in the aseptic forms of nephritis. Neither was there any difference in the chemical constituents of the urine nor of the appearance of the kidney when it was exposed. The results of operation in these cases were very much more satisfactory, however, than in aseptic cases, and Rovsing believes that his cases show definitely that unilateral chronic nephritis may be of infectious origin; that it may affect a greater or smaller part of the kidney, or that we may have a double partial infectious nephritis. Stripping of the kidney capsule, which gives such favorable results in cases of aseptic interstitial nephritis with perinephritis and severe pain, also has a favorable influence on inflammatory processes. In hemorrhagic cases he believes that splitting the kidney will give favorable results in the milder infections, such as by *Bacterium coli*, but it is dangerous in the more virulent infections. Resection of the diseased part in case of local infectious nephritis which entirely resembled chronic aseptic nephritis led to cure in two of his cases."

A. D. Bevan¹ presented a paper on the **surgical treatment of anuria** before the Chicago Surgical Society, January 5, 1903. After discussing the literature and one of his own cases he submitted the following conclusions: "(1) The clinical importance of recognizing the three forms of anuria—obstructive, reflex, and nonobstructive. (2) The imperative necessity of surgical interference in the obstructive and reflex forms, and its possible value in the nonobstructive cases. (3) In the first two varieties a rapid nephrotomy on the side of pain, tenderness, and muscular rigidity is the operation of choice. If necessary, do not hesitate to make a double nephrotomy. (4) Nitrous-oxid anesthesia is probably to be preferred. (5) Time-consuming operations to relieve permanently the obstruction are to be postponed to a later period, after the patient has recovered from the anuria. (6) Operate by the beginning of the third day."

A. Pousson,² in a review of the subject of **surgical intervention for nephritis**, divides the disease into acute toxic infections and the true Bright's disease. Pousson has operated upon 4 cases falling under the heading of acute toxic infections, performing nephrotomy in 2 and nephrectomy in 2; 3 of the patients recovered. The infection in 1 case was influenzal, in 2 it was due to the colon bacillus, and in 1 was an

¹ Med. News Jan. 17, 1903.

² Ann. des Mal. des Organes Genito-Urinaires, Nos. 5, 6, 7, May, June, and July, 1902.

acute exacerbation of an old pyelonephritis. Nephrotomy is the operation of choice in the acute infectious cases. In 6 cases of Bright's disease the author performed nephrotomy; 4 were improved and 2 died.

C. H. Chetwood¹ reports a case of **hematuria of 4 years' duration** in which there was a relatively small amount of deterioration in the general health and in which the urinary analysis revealed nothing abnormal present except blood. A cystoscopic examination demonstrated blood flowing from the right ureter. At the operation the kidney appeared normal even after bisection. A microscopic study of a small section removed at the time of operation showed chronic parenchymatous nephritis. The hematuria ceased after operation.

Horace J. Whitacre² reports a case of **suppression of urine** which had endured 8 days and which was relieved by decapsulation of both kidneys.

David Newman³ reports a case of **acute nonsuppurative perinephritis** following an attack of pleurisy. There was great pain and tenderness in the right renal region, and in this region was a firm mass. There were no constitutional symptoms and the urine gave no evidence of renal trouble. An incision revealed a normal kidney surrounded by a mass of inflammatory material mixed with fat. The patient recovered.

Jos. Ransohoff⁴ reports a case of **unilateral chronic nephritis** which was mistaken for a case of kidney stone and in which exploratory splitting of the capsule was followed by recovery. The diagnosis of chronic nephritis was made from a microscopic study of a section removed at the time of operation.

Frederic Bierhoff⁵ published a **method for diagnosing renal calculus** which is as follows: "A good-sized ureteral catheter is passed up into the renal pelvis, and through this tepid, sterilized 1 % boric acid solution is gently injected until the patient complains of a sensation of pressure in the renal region, usually about 30 cc. being required. The fluid is then allowed to flow off, and the maneuver is repeated until 250 to 300 cc. in all has been employed." When a stone is present, the procedure is followed by hematuria within 24 hours; when no stone is present, no hematuria follows. This method has been employed in 5 instances. "In two, as a result, a positive diagnosis of calculus was made, which was confirmed by a subsequent radiograph in one instance, and by operation in both. In the second of these two cases, repeated x-ray examination by an expert radiographer would not permit of positive corroboration by this means. In three instances a negative diagnosis was made, to be corroborated by radiography in two instances, and by operation in the third."

An unusually interesting case of **renal calculus** is reported by Ferguson.⁶ The patient was a boy upon whom Ferguson first operated for a pyonephritis complicated by stone and urinary fistula. At this time nephrectomy was done. A few weeks subsequent to this operation the

¹ Med. News, Feb. 7, 1903.

² Brit. Med. Jour., July 19, 1902.

³ Med. News, Oct. 11, 1902.

⁴ Jour. Am. Med. Assoc., May 23, 1903.

⁵ Jour. Am. Med. Assoc., May 30, 1903.

⁶ Jour. Am. Med. Assoc., July 5, 1903.

patient developed obstruction of the opposite ureter by a calculus. The stone was found two inches below the kidney, was pushed back into the pelvis and removed. Before the patient left the hospital he developed obstruction of the urethra from lodgment of a stone, which was removed after splitting the meatus. About a month after the operation the patient presented symptoms of calculus in the urinary bladder and suprapubic cystotomy was performed. Two months and a half after this operation the patient was quite well.

H. H. Young¹ reports 4 cases of **calculus in the lower end of the ureter**. Case I: Calculus impacted in the lower end of the left ureter for probably 27 years. Removal by extraperitoneal ureterolithotomy through an iliac incision. Intravesical ureterotomy for stricture of the lower end of the ureter. Recovery. Case II: Calculus impacted in the lower end of the ureter. Extracted by means of a ureter catheter cystoscope. Case III: Calculus impacted in the right ureter about 2 cm. above its lowest orifice. Demonstration by cystoscope and catheter and by x-ray. Complete disappearance after water cure. Case IV: Removal of 3 large calculi from the lower end of the left ureter through an extraperitoneal (iliac) incision. Recovery. Calculi may be extracted from the lower end of the ureter by the intravesical route, by the cystoscope, by the perineal route, by the intrarectal route, by the pararectal route, by the sacral route (resection of a portion of the sacrum), by the intraperitoneal route, and by the iliac extraperitoneal route—the best, according to Young. With careful history, vigorous repeated bimanual rectal examination, radiographs, and the cystoscope, the diagnosis of calculus, its location, and the relative condition of the kidneys are easily and certainly determined.

J. F. Percy² reports a case of **hypernephroma** which was treated by nephrectomy. The patient, a boy of 15, later died of metastatic growths in the brain and lungs.

Borelius³ says **polycystic kidney** may manifest itself in one of three forms. The first simulates small contracted kidney, there being the same condition of the urine and of the heart. The differential diagnosis is made by palpating the enlarged organs. The second form resembles nephritic colic. The third form is that in which the patient has reached the stage of uremia. The finding of large kidneys on palpation is the principal diagnostic sign. Hematuria and albuminuria are not typical. Heredity plays an important part; three of the 4 cases observed by the author occurred in a man, his son, and his nephew. Aspiration is sometimes of value for diagnostic purposes. Large kidneys associated with a diminished amount of urea in the urine constitute a contraindication to operation. In two of Borelius's cases a renal tumor was supposed to exist. The condition probably begins at birth and slowly develops during the remaining portion of life.

Edgar Garceau⁴ analyzes 415 cases in which some operation was performed for **tuberculosis of the kidney**.

¹ Amer. Med., Aug. 9, 1902.

² Nord. Med. Arch., xxxiv, No. 4.

³ Clin. Rev., Aug., 1902.

⁴ Boston M. and S. Jour., July 3, 1902.

OPERATIONS.

Nephrectomies	257
Nephrotomies	42
Nephrotomies followed by nephrectomies	84
Nephrectomies and total resection of the ureter	16
Lumbar nephrectomy and partial resection of ureter	10
Resections	6
Total	415

GENERAL SUMMARY.

Total number of cases	415
Total number of deaths	122
Immediate deaths (within one month)	74
Deaths later	48
Percentage of immediate deaths	17.8
General mortality	29.4
Deaths from tuberculosis elsewhere in body	49

SURVIVALS.

Total number of survivals	293
Time not stated	95
No improvement	3
Improved only and still affected by the disease	49

RECOVERIES.

1 year or under	88
2 years	20
3 "	11
4 "	13
5 "	3
6 "	3
7 "	1
8 "	2
9 "	1
10 "	0
11 "	2
12 "	1
21 "	1
—	293

Total survivals two years or more	58
Percentage	14
Total number of cases well from within a few months of operation, and therefore promising cases, added to survivals two years or more	241
Percentage of promising cases	58

There were 266 operations on the female, 128 on the male, and 22 in which the sex is not given. The greater proportion of females is explained by the fact that in males some other portion of the genitourinary apparatus is also involved, rendering them unfit for any operation. The following table gives the ages at which the disease occurs:

1 to 10 years	9
10 to 20 "	40
20 to 30 "	135
30 to 40 "	140
40 to 50 "	40
50 to 60 "	4
60 to 70 "	2
Age not given	45
Total	415

The miliary form of tuberculosis is by far the commoner, and as a rule never goes into the caseous form to any great extent, the patient dying before this occurs from tuberculosis in other parts of the body. In the 415 cases tuberculosis of other organs was mentioned 54 times, the lungs having been affected 37 times. Caseous disease of both kidneys was mentioned 27 times (6.5 %) and immediate death ensued in 24 % of these cases, the disease not having been recognized in the opposite kidney before the performance of nephrectomy. Infection through the urethra is not common. The bladder may be exposed for a long period to the contact of tubercle bacilli without becoming affected. In none of the cases was any reference made to the condition of the genital apparatus in the female. In 16 cases of caseous tuberculosis in the male the genitals were affected 8 times (50 %). Vesical tuberculosis as a primary disease is commoner in males than in females. In the female the kidney is the commoner seat of origin.

George M. Edebohls¹ prefers **renal decapsulation** to nephrectomy, resection of the kidney, and nephrotomy whenever it will answer the purpose equally well or better, because it is comparatively innocuous, the danger of hemorrhage is less, the after-treatment is simpler, and urinary fistula is avoided. He presents a preliminary report of 6 cases in which decapsulation was performed for **conditions other than Bright's disease**. They are as follows: (1) Acute pyelonephritis with miliary abscesses; right nephrectomy and decapsulation of the left kidney. (2) Acute right pyelonephritis with miliary abscesses; decapsulation of the right kidney. (3) Acute hemorrhagic nephritis; decapsulation of both kidneys. (4) Intermittent hydronephrosis of the right kidney associated with chronic Bright's disease; decapsulation and fixation of the right kidney. (5) Intermittent right pyonephrosis and chronic interstitial nephritis; decapsulation and fixation of the right kidney. (6) Polycystic degeneration of the kidneys and chronic diffuse nephritis; decapsulation of both kidneys. All of the patients recovered.

J. L. Thomas² has performed **nephropexy** by the Vulliet method 10 times with satisfactory results. Vulliet's method consists in the fixation of the kidney by means of a detached strip of the tendon of the erector spinæ passed through the parenchyma of the kidney. Thomas suggests the use of a small swivel fixed to a long delicate handle for the purpose of facilitating the separation of the fasciculus of tendon. He makes 2 longitudinal incisions in the fibrous capsule of the kidney, one near the outer border of the organ, and one near the hilum; the capsule is then freed from the parenchyma by blunt dissection and the split tendon of the erector spinæ is passed beneath the separated capsule from without inward, the ends being secured in the wound near the spine. A few sutures are passed through the capsule and the fascia lumborum.

A. H. Goelet³ emphasizes the importance of **nephroptosis** in producing renal disease and disease of the female pelvic organs. Nephroptosis causes disease of the female pelvic organs by compressing the ovarian

¹ Brit. Med. Jour., Nov. 8, 1902.

² Brit. Med. Jour., Nov. 8, 1902.

³ Amer. Med., Oct. 3, 1902.

vein and interfering with the return circulation from the pelvis. In prolapse of the third or fourth degree the kidney may be affected by nephritis, perinephritis, pyelonephritis, hydronephrosis, pyonephrosis, and atrophy, or, in other words, such diseases as would result from prolonged congestion of the organ or from obstruction to the ureter. Operation is not advised for prolapse of the first or second degree, except when the left kidney is found to be in the second degree of prolapse at the time of an operation on the right kidney, the left kidney being fixed at the same time to obviate the necessity for a second operation later, prolapse of the second degree always being progressive. Operation is always necessary for nephroptosis of the third degree. It is unnecessary to decapsulate the kidney or to transfix the parenchyma with sutures. Firm adhesion of the fibrous capsule to the muscles of the back may

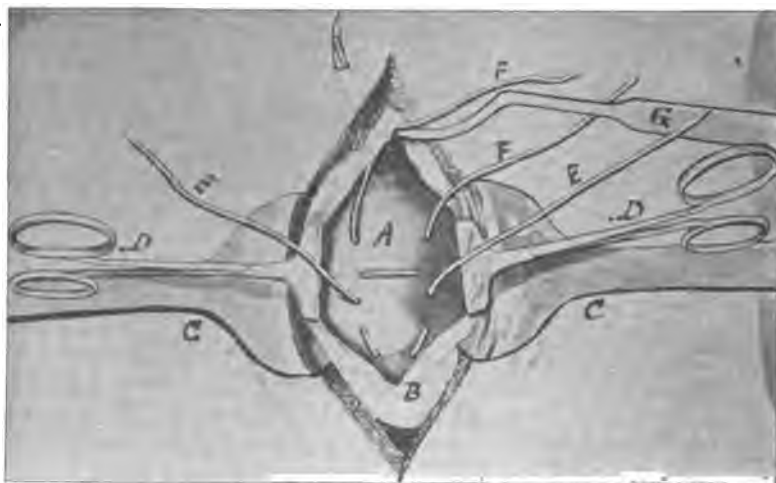


Fig. 52.—Showing details of operation and method of insertion of the sustaining sutures: *A*, Kidney; *B*, fatty capsule; *C*, retractors separating margins of lumbar incision; *DD*, I-forceps drawing out fatty capsule; *EE*, the first or lower sustaining suture; *FF*, second or upper sustaining suture; *G*, needle carrying end of suture from within out through the structures of the back at upper angle of the wound (Goelet, in Amer. Med., Oct. 4, 1902).

be secured if these two structures are held in contact for a sufficient length of time. Goelet employs 2 sutures of silkworm-gut, one having 3 insertions under the fibrous capsule of half an inch in length each, and the other, 2 insertions of the same length (see Fig. 52). They are brought out through the structures of the back at the upper angle of the wound, just below the last rib, and are tied over a small pad of gauze to prevent cutting and loosening of the suture loop, which would permit the kidney to sag and destroy the chance of adhesion. These sutures are removed at the end of 3 weeks. Goelet has fixed 136 kidneys by this method without a death or a relapse.

Max Brödel¹ suggests a more rational method of passing the

¹ Amer. Med., Aug. 2, 1902.

suture in fixation of the kidney. The simple through-and-through sutures tear out because they pass in the same plane with the framework of the cortex. The direction of the suture proposed by Brödel is at right angles to the framework of the cortex. The fibrous capsule, being the most resistant structure, is utilized instead of the kidney-substance to form the main support for the suture. The suture is passed in a triangular manner through the cortex so as to leave two suture bridges on the surface of the kidney. These bridges bear the brunt of the work, and traction on the suture is borne by them instead of by the circulatory or secretory structures of the kidney. To make this suture tear, the bridge must pull the fibrous capsule into the cortical substance of the kidney, a procedure requiring considerable force. The bridges should not be shorter than 7 mm. in length.

A. E. Gallant¹ concludes a paper on **the corset for movable kidney** as follows: "(1) The symptom-complex designated movable kidney, Glénard's disease, etc., cannot be accounted for on the ground of simple kidney mobility or prolapse. (2) Nephroptosis is nearly always associated with ptosis of other abdominal and pelvic viscera, subnormal nutrition and nervous instability. (3) Treatment to be successful must be directed toward the replacement and support of the prolapsed viscera, the correction of functional derangements, and improvement of general nutrition. (4) Nephropexy without replacement and support of the abdominal viscera will fail to bring relief. (5) Nephropexy is indicated only when operating upon a true 'surgical kidney.' (6) A corset measured, fitted, and put on while the woman is lying in the dorsal posture, and worn continuously when not lying down, will elevate and support the viscera and immobilize the ectopic kidney. (7) The corset affords maximum pressure over the suprapubic area, minimum compression above the waist-line, and ample space for heart, lungs, and intestines; gives a refreshing sense of comfort as soon as put on; Dietl's crises cease, and as time goes by, gastrointestinal action improves, nervousness diminishes, anemia is dissipated, and a well-marked increase in body-weight ensues. (8) A corset made on this plan has been found of great service to women with pendulous abdomen, adiposis; replaces the abdominal binder after childbed and celiotomy; and for young girls when first they adopt skirts suspended from the waist, the wearing of such a corset is prophylactic to the production of Glénard's disease."

Ramon Guiteras² outlines in detail the various types of operations employed since Hahn first **fixed the kidney** and describes his own method. He denudes one-half of the posterior surface of the kidney, that nearest the convexity, and leaves the anterior surface intact. Two retention sutures of chromicized catgut are passed through the peeled back capsule at the point of reflection, the upper suture at the junction of the middle and upper thirds of the kidney, the lower suture at the junction of the lower and middle thirds of the organ. The needle is inserted near the edge of the reflection, includes both layers of the capsule, and passes under the layer still adhering to the parenchyma

¹ Internat. Jour. of Surg., Feb., 1903.

² Med. Rec., April 11, 1903.

for $\frac{3}{4}$ of an inch and emerges through the outer reflected layer. The 2 anterior retention sutures are inserted at levels corresponding to those of the posterior set. The suture is passed under the edge of the cut capsule to a point situated $\frac{3}{4}$ of an inch from this edge on the anterior surface, where it pierces the capsule, passes over the capsule for $\frac{3}{4}$ of an inch vertically, and again pierces the capsule from without inward, running under it and emerging at the free end of the fibrous coat at the convexity of the organ. These sutures are passed through and tied over the muscles in such a way as to bring the kidney into close apposition with the parietes as nearly as possible at the normal level.

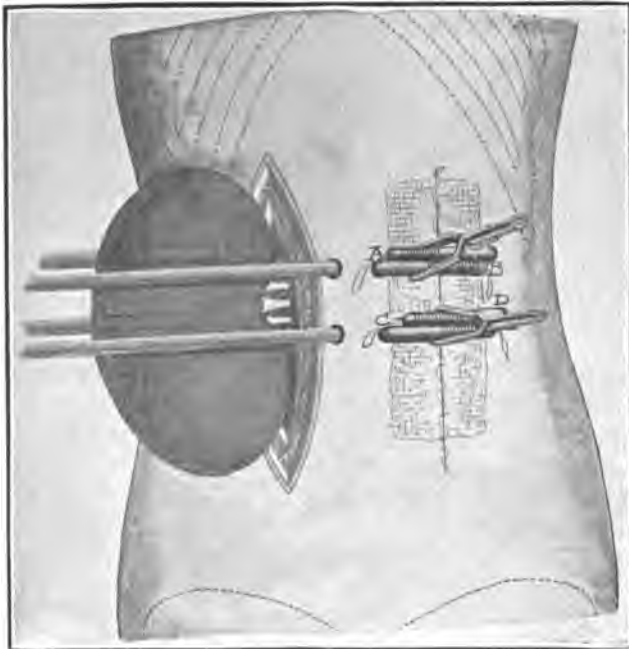


Fig. 53.—Milbank Johnson's modification of Penrose's operation for nephropexy (Donaldson, in *Amer. Med.*, Feb. 28, 1903).

Frank Donaldson¹ describes a modification of technic in the Penrose operation for nephropexy which he credits to Milbank Johnson. "He makes 4 openings about 15 mm. on either side of the main incision, A B C and D, Fig. 53. These incisions go through skin, fascia, and muscle. The catheter is then passed through the opening A, on through the fatty capsule a few millimeters to the side of the main incision in the same, around the kidney proper about 1 cm. from and above the ureter and renal vessels, and out through the fatty capsule and the opening B on the opposite side. Similarly, a second catheter is introduced through the opening C and brought around below the ureter and vessels of the

¹ *Amer. Med.*, Feb. 28, 1903.

kidney and out through the opening D. The incision is then closed." After exerting the proper amount of tension on the kidney the catheters are clamped together. The rubber tube does not prevent healing of the original wound, as is the case in the Penrose operation.

F. P. Canac-Marquis¹ describes his **method of anchoring floating kidney**. After incising the capsule to the extent of 8 cm. on its dorsum, the capsule is freed for 3 or 4 cm. in all directions and a double silkworm-gut continuous suture is made on "each side of the incision, starting at *a* (Fig. 54), passing through the skin, fat, muscle, and capsule proper; taking about 1 cm. of the muscles with the capsule proper and passing out in the inverse order, as shown in Fig. 54 at *a*. The same procedure for the opposite side is shown at *b* and *b'*. By pulling these sutures taut, the capsule is drawn to the side and exposes a raw surface of kidney parenchyma about 3 cm. wide and 6 cm. long. A lead nickel-plated shield is threaded and shotted and the shot crushed on these sutures, when moderate tension has been accomplished. The next step in this operation is to draw the muscles over the raw surface of the kidney, which is accomplished by passing double silkworm-gut sutures, starting at *c*, going through skin and fat, crossing over and taking in all of the muscles of opposite side, then recrossing over surface of kidney to take the muscles of the side whence suture started; to be recrossed and take in fat and skin, as shown in Fig. 54 at *c'*. The same procedure is followed in lower angle of incision, as shown in Fig. 54, *e* and *e'*."

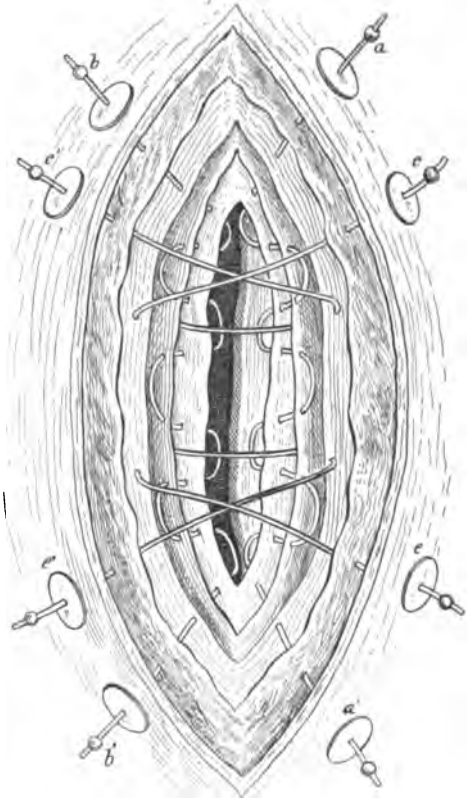


Fig. 54.—Canac-Marquis's method of anchoring a floating kidney (Jour. Am. Med. Assoc., April 4, 1903).

James Swain² says that in all cases of **movable kidney** associated with nervous symptoms or with splanchnoptosis belts should be tried. In younger women with strong abdominal muscles belts are more likely to fail than in older women with lax abdominal walls. A pad under the belt on the side affected is of service. The abandonment of the

¹ Jour. Am. Med. Assoc., April 4, 1903. ² Bristol Med.-Chi. Jour., Dec., 1902.

pad is largely due to the mechanical difficulty of exercising sufficient pressure on the pad without annoying the patient. This difficulty may be overcome by a device which consists of a "freely running adjustable band passing obliquely round the outside of the belt, guided by loops. This passes round the back, and both ends cross over the position of the junction of the middle and lower thirds of the pad placed under the belt, to be fastened by means of buckles securely fixed—one on either side—to the bottom of the belt. By drawing on the ends of the band when passed through the buckles, a direct pressure upward and backward is exerted upon the pad beneath. When belts fail, operation is indicated."

S. T. Brown¹ reports 2 cases of diabetes associated with movable kidney in which nephropexy was followed by a disappearance of the sugar from the urine.

C. A. McWilliams² gives the New York Presbyterian Hospital statistics of movable kidney: "Total, 61 cases: 2 occurred in men; 59, or 96.7 %, in women; 21, or 35.6 %, were single women. Of the married women, 22, or 37.2 % of the whole 59, had borne children. Average number of children to each, 2. Right kidney movable in 53 cases, or 86.8 %. Left kidney movable in 4 cases, or 6.6 %. Both kidneys movable in four cases, or 6.6 %. Average age was 33½ years; youngest, 17; oldest, 65 years. Trauma antecedent in only seven cases, or 11.4 %. Complications: Femoral hernia in 2. Gastrointestinal indigestion in 25. Marked constipation in 28; diarrhea in 3. Jaundice in 1. Chronic appendicitis in 9. Urinary symptoms in 18. Renal colic in 7. Renal calculus in 1. Pyelitis in 1. Chronic nephritis in 2. Neurasthenia in 11. General enteroptosis in 3. Uterine abnormalities in 5. Results of operation: 42 cases followed after operation showed 22, or 52.3 %, cured of subjective symptoms; 15, or 35.7 %, benefited; 5, or 10.9 %, no benefit. Uncomplicated: 19 cases, or 31.1 % of the whole 61. Of these 12, or 63.1 %, were cured. Complicated: 23 cases, or 34.4 % of the whole 61. Of these, 10 or 43.4 %, were cured. Recurrence occurred in 6 cases out of 36 examined, or 16.6 %. Mortality of operation: 2 cases in 61 operations, or 3.2 %."

R. E. Newton³ reports a case of profuse hematuria from a slightly movable kidney which promptly ceased after nephropexy.

Byron Robinson⁴ presents an exhaustive article entitled **landmarks in the ureter**. His remarks were based on the investigation of over 100 ureters of man and animals. Numerous cuts form excellent illustrations of the text. The conclusions are as follows: "(1) The ureter is not a uniform calibered tube. (2) It consists in general of three isthmuses or sphincters located at points in the ureter where projecting adjacent structures compromise; kink its lumen. The ureteral lumen is compromised by: (a) the distal renal pole projecting the ureter medianward, producing what I shall term the proximal isthmus, sphincter or neck of the ureter; (b) the ureteral lumen is compromised at the point where

¹ Phila. Med. Jour., April 4, 1903.

³ Australasian Med. Gaz., Dec. 20, 1902.

² Med. News, Oct. 4 1902.

⁴ Ann. of Surg., Dec., 1902.

the vasa iliaca project the ureter ventralward, producing what the author terms the middle isthmus or sphincter, the flexura iliaca ureteris. The middle ureteral isthmus is due to the increased ventral projection of the ureter by the vasa iliaca on assuming the erect attitude (man, erect bimana). Quadrupeds do not possess the middle ureteral isthmus, and consequently less lumbar ureteral spindle. (c) The lumen of the ureter is compromised at the point where its distal end penetrates obliquely the muscular wall of the urinary bladder. (3) Compromised lumen by isthmuses or sphincters induce ureteral dilations—reservoirs or spindles. There is a ureteral reservoir proximal to each ureteral isthmus, *e. g.*, (a) ureteral pelvis proximal to the proximal isthmus or neck; (b) lumbar spindle proximal to the middle ureteral isthmus; (c) pelvic spindle proximal to the distal ureteral isthmus in its vesical wall. (4) The ureteral spindles are more pronounced in woman than in man on account of the proximal and distal arteria ureterica having an excessive or periodic hyperemia during reproductive life (puberty, menstruation, gestation, puerperium, and climacterium). Consequently, in senescence, when its proximal and distal arteria ureterica become affected with arterial sclerosis or calcification, lack of nourishment will induce pathologic dilations of the lumbar and pelvic spindles. (5) Calculi lodge at the ureteral isthmuses. (6) Torsion of the ureter or kink may easily compromise the ureteral neck or proximal ureteral isthmus. (7) Surgical interventions on the ureter should be performed at the ureteral reservoirs or spindles on account of ample lumen and wall. (8) Pathologic conditions of the ureter lie mainly in defects of the ureteral wall (inflammatory products, paresis, tuberculosis, etc.) producing deficient peristalsis, or in the mechanical obstruction to the ureteral stream (calculus, kink, torsion, stricture). (9) So long as the ureteral peristalsis is not interfered with, and especially the ureteral stream is not obstructed, the ureters perform their function. (10) However, as soon as any mechanical obstruction to the ureteral stream arises (as kink, calculus, stricture), the nondrainage induces residual deposits with resulting accumulations of bacteria, whence the vicious circle occurs in the tractus urinarius exactly similar to vicious circles arising from obstructions in the pylorus or the biliary ducts. (11) The ureter is an independent organ conducting the urine from the kidney to the bladder by rhythmic waves, regardless of altitude or force of gravity. It is an elongated duct interpolated between kidney and bladder with similar functions to the bladder—a reservoir. (12) The ureter being located in a universally loose areolar bed, and being longer than the distance between its proximal and distal ends, is capable of an extensive range of motion in pathologic conditions or for surgical intervention. (13) The irregular caliber of the ureter, dilations (reservoirs, spindles), and constrictions (isthmuses, sphincters) is an hereditary heritage from the Wolffian body enhanced by environments."

Hugh Cabot¹ reports a case of **ureteral anastomosis** following the accidental excision of $\frac{1}{2}$ inch of the right ureter in removing a cancerous uterus. The patient recovered.

¹ Boston M. and S. Jour., Dec. 11, 1902.

A. H. Gould¹ reports 2 cases of **complete bilateral duplication of the ureters**. By complete duplication is meant that both kidneys have each two ureters, and each ureter is separate throughout, having its own orifice in the bladder.

H. A. Kelly² classifies **strictures of the ureter** according to their location, extent, and cause. The location of a stricture may be at any point in the ureteral tract, but is most frequent at the vesical end. The extent varies from a few millimeters to several centimeters. Strictures are caused by inflammation of the ureteral walls produced by the commoner pyogenic organisms, by the gonococcus and by the tubercle bacillus. The commonest cause of inflammation is tuberculosis, the rarest gonorrhea. The symptoms are those of the associated infection, which is rarely localized in the ureter until the disease is well advanced in the bladder or in the kidney. The diagnosis is made by palpation, by inspection, and by ureteral catheterization. The pelvic portion of the ureter is easily accessible to palpation either through the vagina or through the air-distended rectum. On cystoscopic examination the ureteral area is found swollen, deeply injected or surrounded by areas of ulceration; the opening is often obscured so that it appears like a dimple in the midst of a large cushion of puffy mucosa. In these cases it is often extremely difficult to catheterize the ureter. The most characteristic sign of stricture is the strong bite felt upon withdrawing the catheter. The methods of treatment are as follows: "(1) Dilation of the stricture by flexible or metal catheters in a graduated series, up to 4 or 5 mm. in diameter. This is the ideal method. (2) Freeing the ureter from a bed of inflammatory tissue, by dissecting it out. This is occasionally sufficient. (3) Resection of the ureter. This is rarely possible. (4) Extirpation of the entire supravescical urinary tract of the affected side, by a nephroureterectomy or a ureteronephrectomy, or, as I have done in one case, a nephroureterocystectomy. This is the only reliable method in cases of tuberculosis, as well as of pyoureter and pyelonephrosis of long standing. (5) Amputation and implantation of the bladder. This is applicable when the stricture is low down, the opposite side diseased and the diseased side still capable of doing some work. (6) Complete division of the stricture. This plan may be of service when the stricture is unusually tight. Important accessories to the treatment, and preliminaries to any active operative interference are the evacuation of the old urine or pus accumulated above the strictures, and the sterilization of the upper urinary tract by the injection of solutions of boracic acid, mercuric chlorid, silver nitrate, or formalin."

F. Cathelin³ describes a **new instrument for segregation of the urine**. The instrument consists of a No. 25 French catheter inside of which runs a stylet which is graduated at the proximal end and has attached to its vesical end a fine steel spring which may be folded flat so as to pass through the catheter and which when extruded from the vesical end of the instrument springs into an elliptic form dividing the

¹ Am. Jour. Med. Sci., March, 1903.

² Jour. Am. Med. Assoc., Aug. 16, 1902.

³ Ann. des Mal. des Organes Genito-Uriinaires, No. 7, July, 1902.

bladder into two halves. Attached to the elliptic steel spring is a thin rubber membrane which prevents the urine on one side of the bladder mingling with the urine on the other side of the bladder. Running through the shaft of the instrument are 2 fine catheters, one of which drains the right half and one of which drains the left half of the bladder. The outer end of the shaft of the instrument is supported by an upright. Each catheter drains into a small flask, so that the urine from each kidney may be examined separately.

Martin B. Tinker¹ believes that a sufficiently large number of **cryoscopic examinations** have been made by reliable observers to prove positively the value of the test. Casper and Richter place a higher value on cryoscopic tests of the urine and blood than on the phloridzin test, quantitative estimation of urea, or other usual methods, but lay special stress on the agreement of all these methods when tried in a given case. The methylene-blue test is not of sufficient value to be used as a routine. Rumpel has tested the freezing-point of the blood and urine in a series of cases of typhoid fever and other diseases, and finds no important variation from the normal point of healthy individuals. Under normal conditions the freezing-point of urine varies between -0.9° C. and -2.0° C. A freezing-point above -0.9° C. indicates fewer solids in the urine, and therefore renal insufficiency. Normal blood has a freezing-point of -0.56° C. with a variation between -0.55° C. and -0.57° C., or only 0.02 degree. An increase of the freezing-point to over -0.58° C. indicates an increase of the solids in the blood and shows that renal insufficiency is present. An advantage of this test over the ordinary chemical tests is that the freezing-point is influenced by all the products excreted in the urine, and there is little doubt that many of these waste products are of as great importance in determining the functional activity of the kidney as are urea and chlorids. This method seems to offer the advantage of greater accuracy, and is simpler than the elaborate methods of quantitative determination of specific gravity which must be used when accurate results are desired. Tinker tested the blood of 25 patients with normal kidneys and found that in 23 it froze at exactly -0.56° C. In the two remaining cases there was a variation of 1.01° C. "The modified Heidenhain apparatus was used in these tests. It consists of a thermometer 45 cm. long with a large bulb which is graduated from 1° C. above freezing to 4 degrees below the freezing-point. The degrees are subdivided into tenths and hundredths and the scale is sufficiently large so that $\frac{1}{100}$ of a degree can be easily read. To allow for expansion of the mercury in warm weather and at ordinary room-temperature a reservoir bulb is provided at the upper end of the tube. For ordinary examinations about 20 cc. of blood or urine are taken. The blood or urine to be examined is placed in a test-tube, which in turn is inserted in a larger tube which makes an air-space about the fluid to be frozen, insuring gradual cooling of the liquid to be examined. To lower the temperature to the freezing-point a mixture of salt and ice may be used, but an apparatus is also on the market in which the lowering

¹ Johns Hopkins Hosp. Bull., June, 1903.

of temperature is brought about by evaporation of ether. The test-tube containing the blood or urine may be placed directly in the salt and ice mixture until the mercury comes down out of the reservoir bulb. This will save a great deal of time in the freezing, and if the blood or urine is warm it may be difficult to freeze it unless this is done. The test-tube containing the solution is then placed within the second tube, which acts as an air-chamber. While the solution is cooling, it is stirred constantly by means of a wire loop so that the solution is thoroughly mixed and kept everywhere at the same temperature. The mercury sinks more or less rapidly, not to the point of freezing, but considerably below it before freezing really takes place. As freezing occurs heat is given off and the mercury again rises to the freezing-point, where it remains for some time. If left in the freezing mixture, however, the mercury again begins to fall and can be reduced if desired to the temperature of the ice and salt mixture. Before the thermometer is used it should be tested by trying the freezing-point of distilled water." The necessary amount of blood may be obtained by a large aspirating syringe in the same way as blood is taken for blood-cultures. It was found necessary to expose the vein by dissection in about one-third of the cases. It is not necessary to defibrinate the blood. Three cases of pus-kidney which later came to necropsy were examined, and in each the variation of the freezing-point from the normal was marked. The value of cryoscopic examination of mixed specimens of urine is far less than the cryoscopic examination of the blood. The chief value of the test is for prognostic purposes. If renal insufficiency of a high degree is found, operation may be contraindicated. Cryoscopic examination is simple and may be made by those little experienced in its use; it does not consume more time than many other methods in general use; the results are more reliable than are obtained by those tests now in general use. The field of cryoscopy is limited, but the method is of decided value when indicated at all.

DISEASES OF THE PENIS, URETHRA, TESTICLE, ETC.

John B. Roberts¹ advocates **excision of the lumbar lymphatic glands in malignant disease of the testicle**. If it is true, as Leaf believes, that the lymph-vessels and veins communicate, both veins and nodes should be excised in all cases.

Paul Thorndike and W. T. Bailey² analyze 75 cases of **tuberculosis of the testicle**. "Cases, 20 to 30 years of age, 50 %; 20 to 40 years of age, 67 %; family history, negative in 86 %; past history, negative in 53 %; gonorrhea, in 30 %; gonorrheal epididymitis, in only one case; left side affected, in 60 %; right side affected, in 36 %; both affected, in 18 %; trauma assigned as cause, in 12 %; previous urinary symptoms, absent in 59 cases; previous urinary symptoms, present in 9 cases; symptoms indicating prostatic involvement, present in only 1 case; examination of lungs not recorded in 39 cases; negative in 23 cases;

¹ Ann. of Surg., Oct., 1902.

² Boston M. and S. Jour., July 3, 1902.

positive in 13 cases; epididymis alone involved, in 42 cases; epididymis and testis involved, in 32 cases; vas deferens involved, in 12 cases; by rectal examination, vesicles involved, in 16 cases; prostate involved, in 13 cases; prostate negative, in 13 cases; pathologic records, present in 36 cases." Thorndike has never operated early enough to make it possible to leave the testicle. He emphasizes the importance of castration even when there are tuberculous lesions in other portions of the body. [If the disease is limited to the epididymis, we believe epididymectomy should be performed. If the testicle proper is at all involved, the entire testicle should be removed. Until recently it was believed that orchidectomy is useless if the prostate or vesicles are involved. Koenig and others maintain that removal of a tuberculous testicle or epididymis is followed by distinct improvement in a tuberculous prostate or in tuberculous vesicles.]

A. A. Cabot¹ reports a case of **strangulation of the testicle due to torsion of the cord**. At operation the cord was found to be twisted 360 degrees. The mesorchium was short and the cord was wrapped tightly around it. The testicle was gangrenous, hence it was removed.

W. W. Williams² reports a case of **gangrene of the testicle due to torsion of the cord**. Recovery followed castration.

J. B. Christopherson³ reports a case of **imperfect descent of the testicles** in which both testicles were found in the right inguinal canal.

S. F. Long⁴ describes a method of **circumcision**. The skin is removed from the base instead of the end of the penis. A triangular piece of skin is removed from the dorsum of the penis, the amount of skin to be removed being determined by the length of the foreskin. If the foreskin is 1 inch in length, the denudation should extend 2 inches along the dorsum. "Having ascertained the amount to be removed and marked the point on the dorsum and on each side at the base with small forceps, we proceed with a sharp scalpel to outline the section to be removed. Beginning at the juncture of the organ with the pubes and extending around either side about two-thirds the circumference, passing around the marking forceps and including them in the piece to be removed, with a neat curve we proceed in a direct line to the dorsal forceps, passing around them and thence down the other side encircling the other lateral forceps, and up to the point of beginning. The section of skin should be carefully dissected off, leaving the fascia and blood-vessels undisturbed. The parts are now approximated and the stitches put in, completing the operation." The advantages claimed over the old operation are: "The delicate grading of skin with mucous membrane has not been disturbed; sensitive nerves are not severed; there is no hemorrhage except the very slight oozing from the capillaries of the severed skin; circulation has not been interrupted and edema has been avoided; the wound can be made aseptic and less painful; the dressings do not become soiled or wet by the urine, and may remain until union is complete; the slight line or scar is covered by the hair,

¹ Boston M. and S. Jour., June 25, 1903.

² Brit. Med. Jour., Feb. 7, 1903.

³ N. Y. Med. Jour., June 6, 1903.

⁴ Pacific Med. Jour., Oct., 1902.

as it is reproduced; the operation is more easily done, and the wound is healed in half the time required by the old method."

L. J. Krause¹ publishes a method of obviating the difficulty of severing the skin and mucous membrane exactly opposite each other in **circumcision**. "A sharp-pointed bistoury is passed to the point at which it is desired to make the section, and then pierces the skin from within outward. This opening is made exactly in the dorsal middle line. Through the opening is passed a grooved director. The bistoury is then reintroduced and perforates the skin from within outward to one side of

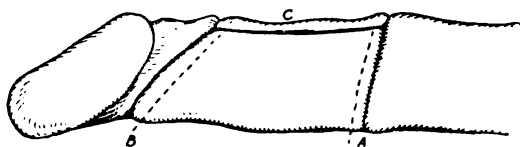


Fig. 55.—Klotz's method of circumcision. The circular and longitudinal incisions (Medicine, Dec., 1902).

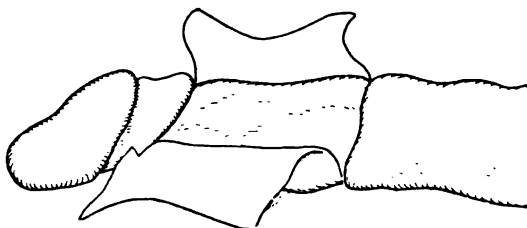


Fig. 56.—Klotz's method of circumcision. The cuff-shaped flap of skin is dissected off all around the penis (Medicine, Dec., 1902).

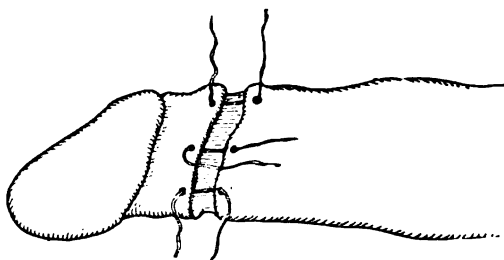


Fig. 57.—Klotz's method of circumcision. The two edges are brought together and sutured (Medicine, Dec., 1902).

the frenum. The grooved director which has been introduced through the upper opening is then passed out through this lower opening, and a pair of scissors severs the integument and mucous membrane in a clean cut exactly opposite, and when the sutures are introduced there is no puckering. The same procedure is then repeated upon the opposite side of the frenum."

Walter C. Klotz² describes a new method of **circumcision**. "The

¹ Cincinnati Lancet-Clinic, Nov. 29, 1902.

² N. Y. Med. Jour., Oct. 4, 1902.

prepuce is retracted toward the root of the penis, and held moderately tense. A circular incision (Fig. 55, *A*) is made around the penis from 2 to 3 inches behind the coronal sulcus, according to the amount of skin it is desirable to remove. This incision should divide only the skin as far as areolar tissue. A second incision (Fig. 55, *B*) is made around the penis about $\frac{1}{2}$ inch behind the coronal sulcus. This should be like the first, but in a plane placed more obliquely, so as to be parallel with the line of insertion of the glans. The two circular incisions are then joined by a longitudinal one (Fig. 55, *C*) along the dorsum of the penis, and, beginning along the edges of the latter, the cuff-shaped flap of skin outlined by the 3 incisions should now be dissected off all around the penis (Fig. 56). The two edges are then brought together (Fig. 57)."

DISEASES OF THE BLADDER AND PROSTATE.

J. B. Bissell¹ discusses the diagnosis and treatment of tuberculous cystitis. It is shown that a slight traumatism is much more apt to be the exciting cause of tubercular cystitis than a severe traumatism. The condition is rarely primary, arising as a rule either from the prostate or kidney. In spite of the fact that Koenig denies that the disease is ever primary, the author believes that it sometimes though seldom is, and reports a case. The normal mucous membrane strongly resists infection from the tubercle bacillus and infection is rare except when the mucous membrane has been injured. The disease is most usual in males between the ages of 17 and 40. The most frequent symptom is hematuria, which is often very slight and accompanied by little or no pain. Frequently it is inconstant; it usually appears at the end of micturition, varying in amount from a few drops to a teaspoonful. It is probably the earliest symptom of the disease. The hematuria which comes on later in the disease, indicating the ulcerating stages, is a different hemorrhage. It lasts longer and comes earlier in the act of urination, and the pain which accompanies it is often severe. As the disease develops, pain becomes a more or less constant symptom, and sometimes becomes so severe as to suggest calculus. Large quantities of bladder epithelium are frequently found in the pus. The frequent voiding of clear urine without pain and without apparent cause, with a few drops of bright-red blood at the end of urination, or, less often preceding it, is almost pathognomonic of beginning tuberculous cystitis. The urine is acid, although toward the end it may become neutral or even ammoniacal. The ulceration may be so extensive as to perforate the bladder-wall. Incontinence is rare unless the process has reached the neck of the bladder and the latter has become extensively involved. The cystoscope is of great value if used carefully. Early in the disease the tuberculous process begins with grayish-white nodules which when seen after coalescing and before breaking down may be mistaken for a neoplasm. Examination per rectum often shows nodules in both lobes of the prostate and thickening of the walls of the seminal vesicles, as well as tenderness to pressure in this

¹ Phila. Med. Jour., Sept. 6, 1902.

location. If the tubercle bacillus is certainly found, the discovery proves the diagnosis, but it must be borne in mind that the smegma bacillus resembles it so closely that at times it will deceive an expert observer. The differentiation may be made by the inoculation of animals. The personal and family history and the examination of all the organs of the body are of great assistance in arriving at a proper diagnosis. The history or trauma, however slight, whether of an external injury, a previous attack of acute or chronic urethritis, overdistention of the bladder, instrumentation, irritant injection, or a common cold producing a congestion of the bladder-wall, may be of great help in determining the diagnosis. Bissell considers the pulse in cases of tuberculous cystitis as quite suggestive. It is almost always more rapid than normal, ranging from 90 to 110. The temperature is slightly elevated. Exercise is apt to produce a desire to urinate. The differential diagnosis between stone and tuberculosis is often made with the greatest difficulty. It must be borne in mind that the use of the sound is dangerous, and that it is an instrument which must be employed with the greatest care. The author thinks that the treatment should consist largely in the adoption of general and hygienic measures and is very much opposed to operation. When drainage of the bladder is obtained, it should be by the suprapubic route, as suprapubic cystostomy opens the bladder at a distance from the local lesion.

In discussing the **causes, symptoms, and treatment of cystalgia**, Lydston¹ states that among the causes are: Lesions of the urinary tract, lesions of the neighboring organs, such as the prostate, rectum, etc.; locomotor ataxia and general paralysis, diathetic conditions, such as gout and rheumatism; diseases of the testis and spermatic cord; lead poisoning and malarial infection. Cystalgia may occur in hysteric and chloranemic patients and sexual disturbances and abuses may produce it. In treating this condition the physician should be careful not to treat too radically some slight lesion of the urinary tract, which lesion is inconsiderable in proportion to the pain suffered. The true cause should be looked for and removed if possible. The immediate treatment consists in the use of sedatives, such as opium, belladonna, etc., and the employment of hot sitzbaths. Predisposing causes such as gout, malaria, or general debility, require special attention.

In discussing the **etiology and treatment of chronic cystitis**, Stokes² refers to the various avenues by which microorganisms may gain access to the bladder. The old idea that the urine in chronic cystitis is always alkaline does not hold, since in at least one-half of the cases the urine is acid. The treatment will be influenced by the cause of the condition, and Stokes objects to the indiscriminate employment of urotropin in cystitis. The drug should only be used in those cases in which there is alkaline urine. In cystitis of gonorrheal or pyogenic origin, irrigation with silver solution is favored. Mercuric chlorid solution should never be used in cystitis of gonorrheal origin, nor should silver solution be used

¹ Jour. Am. Med. Assoc., Aug. 23, 1902.

² Jour. Am. Med. Assoc., Sept. 27, 1902.

in tuberculous cystitis. Perineal drainage is to be preferred to suprapubic drainage for chronic cystitis.

Valentine,¹ in discussing **aids to cystoscopic practice**, describes a "box phantom" which consists of a small box at the bottom of which is a schematic circular device separated into 4 segments. A larger phantom is also described which is a little more complicated, and its use should follow that of the first. These mechanical devices are used in order to perfect one's self in the use of the cystoscope.

Milton² discusses **bilharziosis** from the **surgical point** of view, relating his experience in the Kasr-el-Aini Hospital of Cairo. The only places in which this disease offers opportunity for relief by surgical means are in the bladder, the urethra, the rectum, and the female genital organs. It presents itself in 3 forms—the atrophic, the hypertrophic, and a combination of the two. It most frequently attacks the bladder, its symptoms being hematuria occurring at the end of micturition, pain and scalding during micturition, and frequent micturition. These symptoms occur in the early stages of the disease. Later there are presented all the symptoms of an intractable septic cystitis. The patient is frequently subject to stone. In cases in which the formation of the bilharzial tissue is extreme, adhesions may form between the distended bladder and the anterior abdominal wall, with the subsequent formation of urinary fistulas. When the ureter becomes involved, obstruction to the passage of urine is apt to occur. This obstruction may be the result of narrowing in the atrophic form, and of polypi in the hypertrophic form of the disease. After discussing the various forms of the disease and their treatments, Milton concludes his article with some interesting statistics. At the Kasr-el-Aini Hospital, during the year 1901, 930 cases of this disease were treated; 714 of these in the out-patient department alone. The disease is most frequent between the ages of 15 and 45, although it may occur at any age; 893 patients were males and only 37 were females. The black races seem to enjoy a certain amount of immunity from the disease, which is most prevalent among the peasants of lower Egypt. It is shown that many more people suffer from the disease than are aware of the fact, which is proved by the examination of the urine of a large number of school-children, in which the bilharzia was frequently discovered.

J. H. Jacobson³ (Toledo) reports a case of **transplantation of the ureters with a portion of the trigone into the rectum for the cure of exstrophy of the bladder**. The patient was a man of 29 years who had had repeated operations done for the cure of the exstrophy. The openings of the ureters were plainly seen, and into them could be passed without difficulty the ureteral catheters. The urine from both kidneys contained albumin and pus. The patient was put in the Trendelenburg posture, and the ureters, together with a small portion of bladder-wall, separated from the main portion of the bladder and carried into the rectum through a slit on either side about the level of the promontory of

¹ N. Y. Med. Jour., June 6, 1903.

² Lancet, March 28, 1903.

³ Jour. Am. Med. Assoc., Jan. 3, 1903.

the sacrum. The remaining portion of the bladder was then removed. Six months after the operation the patient was voiding urine through the rectum about once every 3 hours, although he could retain it for 6 hours. The urine was voided independently of bowel evacuations. Occasionally during the night the urine passed involuntarily.

Greene and Brooks¹ present a contribution on the **pathology and prognosis of the diseases of the bladder**. The conclusions drawn from their discussion are as follows: "(1) The most frequent cause of diseases of the bladder is: (a) Lesions of the central nervous system, causing dilation, (b) septic processes of various varieties, (c) hypertrophy of the prostate. (2) In all conditions in which the spinal cord or central nervous system is involved, frequent and early catheterizations should be resorted to, to prevent the bad effects of overdistention, or the possibility of cystic rupture. (3) Conditions of the bladder must greatly modify the prognosis in operative procedures for the relief of obstructions of the urinary flow, therefore the importance of cystoscopic and other examinations cannot be too strongly insisted upon. (4) Hypertrophy of the bladder-wall is due to 4 different processes, separate or combined: (a) Inflammatory infiltration, (b) increase of the fibrous connective tissue, (c) smooth muscle hyperplasia, (d) infiltration by new-growth, (e) the clinical symptoms in hypertrophy of the bladder depend on which of these factors predominate."

D. F. Jones² deals with **intraperitoneal rupture of the bladder** and adds to the reported cases 2 of his own which recovered after suture. He has been able to add to Alexander's table (see YEAR-BOOK OF SURGERY, 1903) 9 cases including his own collected from recent literature, making a total of 54 cases of intraperitoneal rupture treated by suture. Thirty-two of the cases were published prior to 1893, and gave a death-rate of $63\frac{1}{2}\%$, while 22 were reported since 1892 and show a mortality of $27\frac{1}{2}\%$. There is an improvement therefore in the death-rate of 36%, and the average interval between the injury is increased 4 hours in the second period over the first. This improvement must therefore be attributed rather to technic than to earlier recognition and earlier operation. Regarding the technic, Jones commends the suggestion of Alexander that the prevesical space should first be opened, and believes that this will undoubtedly save opening the peritoneum in some cases. "The ease with which the suture of the bladder wound is accomplished depends largely upon the position of the patient. The incision should be made with the patient flat, after which the Trendelenburg position should be used and the intestines walled off with large gauzes." The difficulty of suturing the lower end of the bladder wound can be obviated largely by putting the patient in the Trendelenburg position, and by beginning to suture at the upper end of the wound. By this means the wound is pulled up within easy reach, and each suture below can be placed without difficulty. Fine twisted silk is thought to be the most satisfactory suture material. Testing the line of sutures by injecting the bladder is thought to be unnecessary. It is far safer to drain the abdo-

¹ Med. News, June 20, 1903.

² Ann. of Surg., Feb., 1903.

men than not to drain, and gauze drainage is preferable to tubular drainage. Authorities differ regarding the method of draining the bladder; the tendency has been, however, toward either frequent catheterization or frequent urination. Perineal drainage has few advocates at the present time. Symptoms present in both of Jones's cases were: (1) Sudden severe pain in the lower part of the abdomen, which remained as a constant pain. (2) Constant desire to urinate, with inability to do so. (3) Preference for an erect or partially erect position of the body rather than the recumbent position. (4) General tenderness; little or no rigidity. The abdominal wall was so lax in both cases that it bulged with the pressure of the free fluid in the abdomen. (5) A small quantity of bloody urine in the bladder. (6) Dulness in the flanks. The method of injecting air in the bladder is not approved of, nor is that of injecting boracic acid solution, though the latter is less dangerous and may be occasionally necessary. It should never be used, however, unless the patient is prepared for immediate operation. The first case reported is that of a man, 27 years of age, who was operated upon 89 hours after the rupture; the tear was $2\frac{1}{2}$ inches in length, was vertical, and was situated in the posterior wall. It was repaired by two layers of Lembert sutures of silk. The abdomen was flushed with a hot salt solution and a gauze drain was inserted. Constant drainage of the bladder was employed for 6 hours, after which the bladder was kept empty by frequent voluntary acts of micturition. No leakage occurred and the patient recovered. The second patient was a man, 26 years of age. He was operated upon 26 hours after the rupture. The laceration was $1\frac{1}{2}$ inches in length and was situated high on the posterior wall; the technic of the operation was the same as in the first case, with the exception of constant drainage of the bladder kept up for 48 hours. On the second night after the operation, when the patient was on the verge of delirium tremens, he got out of bed and walked about, the wound became infected, and on the seventh day some leakage occurred; this, however, later ceased, and the patient left the hospital in 4 weeks perfectly well.

Daly and Harrison¹ report an instructive case of **intraperitoneal rupture of the bladder** upon which Harrison operated 64 hours after the injury. The patient recovered. The patient was a man aged 36 who, after carrying a pail of water, experienced sudden severe pain in the abdomen. The interesting points in this case are the entire absence of symptoms indicating rupture at the time of the patient's admission to the hospital or for some time afterward. At the time of his admission 10 ounces of clear urine were withdrawn by the catheter, nor was there subsequently any bloody urine found in the bladder. On the third day it was evident that the patient was suffering from a rupture of the bladder, as no urine could be withdrawn and there were other symptoms indicating intraperitoneal rupture, but consent for operation was not obtained until 64 hours after the onset of symptoms. The patient was in a very bad condition at this time and was transfused during the operation. A large quantity of slightly turbid fluid of uriferous odor was

¹ Brit. Med. Jour., Jan. 10, 1903.

found in the abdominal cavity. A rent in the posterior surface of the bladder-wall sufficient in extent to admit the tip of the index-finger was found and carefully sutured with two layers of Lembert sutures of silk, the mucous membrane not being included. The abdominal cavity was washed out and the wound closed. A retention catheter was placed in the bladder, where it remained until the eighth day. Through it a plentiful supply of urine escaped. The patient after the operation for several days was in a bad condition and suffered from uremic delirium. On the eighth day he was much improved, his temperature was normal, and as the wound was healed the sutures were removed. On this day, however, he contrived to tear open his wound and withdraw 2 feet of small intestine. The wound was reopened, the abdominal cavity flushed, and the intestine returned, the patient making a slow but uneventful recovery. This case is interesting not alone on account of the length of time elapsing between the reception of the injury and the operation, but also because of the accident after the operation, the recovery in spite of the accident, and also because there was no history of an injury which would seem likely to have caused a rupture of the bladder. The patient emptied the bladder a short time before the onset of symptoms, but it was learned that he had been drinking, and it is thought that the bladder must have been partially distended at the time of rupture. There have only been 5 cases recorded in which the time between the injury and the operation has been longer or so long as in this case, and of these 5 cases only one patient recovered.

F. Milnes Blumer¹ reports a case of **intraperitoneal rupture of the bladder with operation 2 days later followed by recovery**. The patient was a man 35 years old who ruptured his bladder by falling across a rail. The symptoms were not marked until after the first 24 hours. The rent in the bladder-wall was 2 inches long and was closed with fine silk. The abdominal cavity was drained with a glass tube which was left in for 2 days. A catheter could not be retained or even passed. The lower portion of the wound became infected, which necessitated the removal of some of the stitches. There was some leakage of urine. A catheter at this time was inserted into the bladder and retained. The patient's temperature fell and he made a good recovery. The leakage and subsequent suppuration of the wound are attributed to a small wound at the anterior part of the bladder-wall which was found at the time of operation and closed. It was thought that this wound had been caused by a silver catheter which was passed upon the patient's admission to the hospital.

Ledderhose,² in discussing the treatment of **intraperitoneal rupture of the bladder**, states that so long as no symptoms of peritonitis are present the abdomen should invariably be opened and the bladder sutured, but when peritonitis develops before the patient comes under surgical treatment an expectant plan of treatment should be employed. A retention catheter alone should be depended upon for a time. If a large collection of fluid in the abdominal cavity persists, then it should

¹ Brit. Med. Jour., April 4, 1903.

² Centralbl. f. Chir., No. 26, 1902.

be evacuated by the simplest possible method and no attempt be made to repair the rupture. The author presents a record of cases to show the value of this treatment. He stated that if this method was followed in the treatment of intraperitoneal ruptures of the bladder already complicated with peritonitis the mortality of this condition would be much reduced.

Primary suture of the bladder after suprapubic cystotomy is considered by Hoffmann¹ to be the ideal treatment. The results when this procedure is followed are much better than when drainage has been established, the recovery being much more rapid and complete. The method is not to be used, however, if there are certain contraindications, such as cystitis, thickened and bruised bladder-walls, etc. Hoffmann closes the bladder with two rows of sutures, one of catgut and a second of silk. He also advises fixing the bladder to the abdominal wall after primary suture.

Hugo² reports a case of a man 24 years of age who presented himself at the hospital stating that 5 years before he had been **shot through the bladder**. The bullet entered the left side of the abdomen and passed out through the right buttock. For 2 years there was a discharge of pus and some urine from the abdominal wound. For 2 years the patient had passed a little blood in the urine, and at the time of admission presented evidences of stone. He would not permit a suprapubic section and therefore the bladder was opened through the perineum and 3 stones extracted, one a small free one, another a partially encysted one, hour-glass in shape, and a third small one, which was behind the partially encysted stone. All of the stones were phosphatic. The nucleus of the stone in the deep part of the cyst was a very small piece of lead and a piece of black cloth, which had probably been carried in by the bullet. No nucleus was found in the other calculi. The patient made an uneventful recovery.

A case of perforation of the bladder-wall by a calculus is reported by Lowers.³ The patient was a boy aged 19. The stone was phosphatic and weighed 40 grams. The ulceration of the anterior bladder-wall produced suppuration in the prevesical space, as it always does in such cases. In removing the stone by the suprapubic route the peritoneal cavity was freely opened, but the patient made a complete recovery. Out of 29 cases of perforation of the bladder by stone collected by Chapalain the perforation took place at the anterior wall in only 4 instances. In the majority of cases ulceration occurred either in the posterior or inferior part of the bladder. A condition such as was met with in this case requires prompt drainage and removal of the stone. If it is a large one and the urinary fistula be long and narrow, it will be best to perform perineal or suprapubic lithotomy, rather than to extract the stone through the fistula after previous dilation. In doing the suprapubic operation the danger of opening the peritoneal cavity is very great because of the adhesions.

¹ Münch. med. Woch., Oct. 28, 1902. ² Brit. Med. Jour., Nov. 22, 1902.

³ Jour. de Chir. et Ann. de la Soc. Belge de Chir., No. 5, 1902.
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A case of **complete removal of the urinary bladder** is reported by A. W. Mayo Robson.¹ The patient was a woman whose bladder was extremely involved in a malignant growth. A 4-inch median vertical incision was made and also a 3-inch transverse incision just above the pubes. The recti muscles were divided at their insertion and the peritoneal cavity was opened. The viscus was freely movable and its separation from the peritoneum, the uterus, the vagina, and the pubic arch was accomplished by gradual dissection without producing marked hemorrhage or any other difficulty. The ureters when exposed were divided near their attachment to the bladder. When the bladder had been entirely freed from all its attachments except the urethra, the latter was grasped with forceps and divided. Ureteral catheters were inserted into the divided ureters and held in position by means of catgut sutures. Each ureter with its catheter was then carried through a small incision in the anterior vaginal wall and fixed in this position with sutures. The peritoneal cavity was closed by a continuous catgut suture. The urine passing through the right ureter was normal, but that from the left was small in amount and bloody, indicating probable disease of the left kidney. The patient died on the thirteenth day from uremia. No abdominal symptoms developed at any time after the operation. If the patient had recovered Robson intended to convert the vagina into a bladder and make use of the urethra which had been preserved.

Herbert Lund² reports a case of **complete excision of the male urinary bladder with implantation of the ureters into the rectum for a papillomatous growth**. The patient was a man of 57. The papillomatous growth involved chiefly the trigone and lower half of the bladder, the fundus being fairly free. To the right of the fundus there was a pouch. Although the bladder had been opened for the purpose of drainage to relieve hemorrhage, it was determined to remove the bladder, and this was done, the ureters being divided just proximal to their entrance into the bladder and the ends being carried into the rectum through a small wound. They were not sutured to the rectal wall, but the ligatures attached to them were carried out through the anus and fixed to a piece of drainage-tube. No urine escaped from the rectum, however, until the tube was inserted, when a quantity of urine containing pus and fluid escaped. The patient died on the third day from septic infection of the ureters and kidneys. Both ureters were found dilated with pus and urine and the pelvis of each kidney was filled with these materials. There was a quantity of pus in the urine prior to the operation, and it was undoubtedly the infection of the kidneys and ureters prior to the operation which caused the death of the patient.

In a clinical lecture upon **tumors of the bladder**, Freyer³ first considers epithelial tumors, of which the most common and the most amenable to treatment are the papillomas, which are analogous to cutaneous warts. The type most frequently seen is the pedunculated villous papilloma, varying in size from that of a cherry to that of a walnut. After

¹ Brit. Med. Jour., Nov. 8, 1902.

² Lancet, Dec. 13, 1902.

³ Lancet, Jan. 24, 1903.

removal these are seen to best advantage when placed in water. Freyer has removed a papilloma as large as an orange, attached to the bladder-wall by a pedicle an inch long and as thick as a goose-quill. The growth of a papilloma may be extremely slow, but those of small size may give rise to very grave symptoms. In the vast majority of cases papillomatous tumors occur singly. Instances are on record of spontaneous detachment of a pedunculated papilloma due probably to the spasmodic contraction of the bladder on the tumor. These tumors are most frequently found between the ages of 25 and 50 years. When a growth is seen through the cystoscope to be covered by villi, it is not proper at once to conclude that it is of a benign type, for malignant tumors are sometimes clothed with villi and may even be more or less pedunculated. Benign growths may be recognized by the absence of any hardness about their pedicles or bases and by the fact that the mucous membrane in the vicinity is soft and devoid of infiltration. Adenomas rarely or never occur in the bladder, and Freyer expresses the belief that many such cases reported have been adenomas of the prostate gland. Epithelioma ranks next in frequency to papilloma. It is extremely rare before the age of 40. In the later stages it may ulcerate into the bowel, may extend to the groin, giving rise to pain and edema in the corresponding lower extremity, or it may make its way through the sacrosciatic foramen. Tumors of the connective-tissue type occur but rarely in the bladder, though fibroma, myxoma, and myoma are sometimes encountered. Sarcoma is the most common tumor of this type found in the bladder, but is much rarer than the epithelial growths. Sarcoma occurs as a smooth, dense, rapidly growing tumor involving the entire thickness of the bladder-wall. In referring to the symptoms and diagnosis of bladder tumor, hematuria is first described. It is the most important and usually the earliest symptom in all forms of bladder tumor. The urine is not uniformly mixed with blood as in hemorrhage from the kidneys. The attacks of hematuria are intermittent, lasting from one to several days, and completely ceasing in the intervals. Finally the urine may never be quite free from blood, though at times the bleeding will be more severe than at others. The earlier portions of the urine may be clear and free from blood, the stream gradually growing deeper in color until eventually pure, bright blood is passed. Clots are frequently present, are dark and irregular and unlike the worm-clots occurring in renal hemorrhage. The bleeding is usually independent of position and motion, in these respects differing from hemorrhage due to stone. Profuse bleeding is rare in connection with stone, and is the rule with tumor. The extent and frequency of the bleeding do not bear any proportion to the size of the tumor. Increased frequency of micturition occurs sooner or later with all vesical growths and never disappears until the tumor is removed. It is most marked when the tumor is situated near the neck of the bladder. Occasionally it is the initial symptom, preceding hematuria. Pain is nearly always present in the later stages of all tumors. Retention of urine may occur from various causes. Occasionally shreds of tumor tissue may be found in the urine. Pus appears in the urine if cystitis

exists; this is rare in benign growths, particularly in the early stages, unless the bladder has been infected by instruments. The ureter may become blocked by the tumor, and hydronephrosis result. Rectal or vaginal examination will aid in forming a diagnosis. Freyer describes minutely the Leiter cystoscope and refers to its great value in diagnosing bladder tumors. In washing out a bladder preparatory to the use of a cystoscope, care should be taken to irrigate the bladder slowly and gently so as not to excite fresh bleeding. The bladder should be examined methodically. In the vast majority of instances when a tumor exists it will be found in the vicinity of one of the ureteral openings. Care should be taken that the light is turned off for at least half a minute before withdrawing the cystoscope in order to avoid burning the urethra. That no mishap may take place, Freyer always detaches the connecting cords from the instrument before its withdrawal. The only treatment of bladder tumors which offers the prospect of permanent relief consists in the removal of the growth, and this can best be done through the opening obtained by suprapubic cystotomy. The Trendelenburg position is considered quite unnecessary in the performance of this operation. Freyer has also given up the use of the Petersen bag, which he believes does more harm than good. Having located the tumor with the finger, its pedicle is grasped with a pair of forceps and the tumor is removed by torsion. If the growth is sessile, it will be necessary to use forceps with broad serrated jaws. If the sessile growth is a large one, it should be removed piecemeal, and this can be best accomplished by keeping the bladder well distended with fluid, otherwise there will be danger of the healthy portions of the bladder-wall being nipped. The seat of the tumor can be best examined through an ordinary Ferguson's vaginal speculum; light can be thrown through the speculum by means of an electric forehead lamp. Through the speculum, any remaining portions of the growth may be removed and the base treated as seems necessary. If the growth is malignant, it should be grasped by the forceps and brought well into the wound; this will be facilitated by an assistant's finger in the rectum. The mucous membrane should be incised all around the base of the growth and a free removal accomplished by broad serrated forceps. It is unnecessary and inadvisable to attempt to suture the edges of the mucous membrane over the former site of the tumor. Catgut sutures are absorbed too rapidly to be of any use, and silk sutures might form the nuclei of calculi. Suprapubic drainage is always employed after these operations.

Crandon¹ discusses at length the pathogenesis and pathologic anatomy of enlarged prostate. The work here represented was done largely with a view of investigating the conclusion of the monumental work of Ciechanowski. The article is an extensive one and terminates with the following conclusion: (1) The underlying cause of the usual form of prostatic enlargement and of certain forms of prostatic atrophy is a slow formation of new connective tissue due to infection or to infection aggravating a senile degenerative process. (2) The gonococcus is

¹ Ann. of Surg., Dec., 1902.

probably most often the specific infection because (a) of its great frequency; (b) other inflammatory causes are not common in the parts in question; (c) a great similarity exists between the histology of gonorrheal processes and those seen in these senile prostates. (3) Neoplasms, fibromyomas, and adenomas occur, but may be called rare.

Ransohoff¹ advocates strongly the **prerectal curvilinear incision for prostatic abscess**, and reports 3 cases upon which he has operated by this method. If the acute follicular suppurations of the prostate which attend gonorrhea are excluded, suppuration within the parenchyma is relatively rare. The report of the Massachusetts General Hospital for 8 years shows only 13 cases of acute prostatitis in a total of 25,000 surgical patients. Several of these acute cases were not designated as prostatic abscess. Although the symptoms, local and general, indicate both the nature and seat of the trouble in most instances, nevertheless abscesses within the prostate are sometimes overlooked. This is largely due to the fact that the physician fails to make a digital examination of the rectum. Occasionally the abscess assumes a latent form without functional disturbance of either urethra or bladder and yet periprostatic phlegmons of the gravest character are developed. Ransohoff refers to a case of this kind which was admitted to his wards in a moribund condition. The autopsy revealed an enormous phlegmon of both ischiorectal fossas, gangrene of the anterior rectal wall, and sloughing of the prostate gland. Running free through the large cavity were 2 inches of the intact urethra. The vital resisting power of the urethral wall under stress of sloughing processes around and about it is often observed in extravasation of urine. A large proportion of prostatic abscesses, if untreated, open into both the rectum and urethra. This was the result in 21 out of 67 recorded cases. Such cases are either rapidly fatal or, if recovery ensues, leave urethrorectal fistulas which are often beyond relief. "In 55 out of 115 cases, the abscess opened spontaneously into the urethra or was opened by the beak of a passing instrument. It is self-evident that in this category would be found a large number of follicular abscesses, or such at any rate as would not be deeply placed within the parenchyma. How frequently the urethral drainage of even these superficial abscesses is insufficient is manifested by the chronicity of the discharge and the recurrence of retention symptoms." Whatever their source, deep-seated prostatic abscesses develop without entangling alliances with either the urethra or rectum, although with increase in size they tend to open in one or the other of these channels. Therefore, to drain the abscess between the urethra and rectum is the natural procedure. After referring to the methods of draining the abscess through the urethra and through the rectum the author describes 3 cases in which he established very satisfactory drainage through the perineum without injury to either the rectum or the urethra and in which prompt healing of the abscess took place. He employed a prerectal curvilinear incision, beginning near the tuber ischii of the right side, curving around and within an inch of the anal orifice to the same point on the left side. No staff was used. "After

¹ Ann. of Surg., Nov., 1902.

the division of the superficial fascia with a few fibers from the external sphincter to the bulbocavernosus, the bulb of the corpus spongiosum and the transverse perineal muscles were readily exposed and drawn forward with a blunt retractor. The rectum was then drawn backward, and in the depth of the wound the fibers of the levator ani and the compressor urethræ were held aside after blunt dissection. By this blunt and almost bloodless dissection the rectum was easily separated from the posterior surface of the prostate gland. The urethra was not opened. With an aspirating needle the abscess within the gland was easily located. It was opened through a median posterior incision." In one of the cases there was an escape of gas from the fourth to the eighth day after the operation which was probably due to a slight sloughing of the anterior wall of the rectum. This is the only valid objection which can be urged against the prerectal incision. By adhering closely to the prostatic capsule and guiding the cleavage away from the rectum this danger is but slight. It is maintained that the advantages of this incision greatly outweigh this unlikely wound complication.

Bouffleur¹ recommends the **transvesical cauterization as a substitute for the Bottini operation for the treatment of some forms of prostatic hypertrophy**, and after a study of the two methods he claims the following advantages for the suprapubic or transvesical route: "(1) It admits of an accurate anatomicopathologic diagnosis which is fundamentally essential to intelligent treatment. (2) The cauterization can be made with the galvanocautery or the more commonly possessed Paquelin cautery with ease, rapidity, and safety. A curved cautery-blade would greatly facilitate the procedure. (3) The incision can be accurately placed. (4) We can see the field of operation and the structures being cauterized. (5) The length and depth of the incision can be regulated to meet the requirements in the particular condition found. (6) The temperature of the blade is under direct ocular observation. (7) The time of application can be regulated so as to insure destruction of the tissue, and if the Paquelin is used it can be applied with sufficient force and time to make the incision, regardless of the density of the tissue. (8) There is no danger from bending of the cautery. (9) If hemorrhage does occur, its location can be definitely determined, and measures for its control intelligently and effectively employed, as has been demonstrated by Eisendrath. (10) It is applicable to all forms of enlargement projecting into the bladder, and particularly so in the removal of pedunculated lobes or valve formations. A partial prostatectomy followed by cauterization would be an ideal procedure for such conditions. (11) It is applicable in all cases regardless of urethral obstruction. Such obstructions can frequently be readily removed from within. (12) It admits of the removal of a calculus or the direct treatment of an ulcer. It also admits of suprapubic drainage if the cystitis seems to require it, or if the urethra is impermeable from within. (13) It is not as likely to be followed by infection, phlebitis, sepsis, etc., as the uncertain urethral operation."

¹ Ann. of Surg., July, 1902.

Negretto¹ describes a method of cauterization of the prostate through the rectum for the relief of obstruction due to hypertrophy. The patient is carefully prepared by thoroughly emptying the rectum the day before the operation. The procedure is described as follows: "The patient is placed in the perineal-lithotomy position with the pelvis well raised; rectum dilated with the speculum and packed with sterilized gauze above the prostate. The speculum is then withdrawn, the left index-finger introduced into the rectum, and the center of the gland is sought. Following the index as a guide, the tenaculum is inserted at this point, slight traction upon it being exerted by an assistant. The speculum is replaced and, if necessary, gauze packing introduced to hold back any folds of the rectal mucosa. Cauterization with the Paquelin or galvanocautery is then practised all around the point where the tenaculum is inserted, the cautery being laid flat. The extent and depth of cauterization are regulated according to the size of the gland; but usually it is superficial, as this is generally sufficient to induce involution. However, in the case of a very large gland it has been found advisable to supplement flat cauterization by deep insertion of the cautery immediately around the tenaculum and about to the depth of its point. The operation is said to last only about 2 minutes. After the operation the dose of bismuth and opium is repeated, that the site of operation may be kept clean for several days, and a permanent Nélaton catheter is left in position for a few days, its removal being followed by thorough disinfection of the bladder and urinary passages. The advantage claimed for such use of the catheter is reduction of congestion through mechanical distention of the urethra, and consequent facilitation of the discharge of urine from the bladder. This decrease of congestion plays no small part in the reduction in the size of the gland. On the sixth or seventh day a purge of oil is given, the resulting stool causing the discharge of the gauze packing, which has been left in situ. Usually after 10 or 12 days the catheter is permanently removed, and urine is thereafter voided naturally. In the 12 cases so treated Negretto has had marked improvement or permanent cure, with no unfavorable effects save in a few instances in which there was bloody urine for a day or two after operation. An important factor in the reduction of the size of the prostate by this method is believed to be its power to overcome congestion. The operation is also said to be devoid of danger and to have the inestimable advantage of being without effect upon the genital organs."

E. Wyllys Andrews² describes a method of **performing infrapubic section in prostatectomy**. The infrapubic route is preferred because of the great advantage to be obtained if the surgeon will divide all attachments of the prostate to the pubic arch. The following are the author's conclusions: "(1) The narrowness of the male pelvic outlet becomes surgically important with the overgrown prostate. (2) Overgrowth of the prostate does not cause obstruction unless there is also outside pressure. (3) This may come from the ligaments and muscles without the organ actually pressing upon the ischia or from bony pros-

¹ *Gaz. degli Osped.*, Aug. 10, 1902.

² *Jour. Am. Med. Assoc.*, Oct. 19, 1902.

sure. (4) Relieving the prostate from the fixed space behind the pubis allows it to expand and cures the obstruction. (5) This can be done best by an anterior incision and should be accompanied by a cutting of the prostatic ring and removing a segment extra-urethrally. (6) Incidentally the change of position, lowering the bladder outlet, does away with the retroprostatic pouch, and greatly assists natural drainage. (7) The separation of the prostatic and urethral ligaments from the pubis and the weakening of the urogenital diaphragm are not to be avoided, but sought."

Paul Thorndike¹ reports 9 cases of **prostatectomy** with 1 death, and reaches the following conclusions regarding the condition: "(1) That great relief can be given to all patients suffering from symptoms due to obstructing enlargement of the prostate, either by palliative or by operative means. (2) That the time to resort to operative measures is just as soon as palliative treatment, carefully executed by competent hands, has failed to give relief. (3) That complete prostatectomy is always the operation of choice, because it is the only operative procedure which cures or gives uniformly good results, when successfully performed in proper cases. (4) That the best time for its performance is just as soon as palliative efforts have failed, or are manifestly impossible of execution, and before secondary changes in the bladder and kidneys, due to long-continued obstruction, have taken place. (5) That in those cases which come for surgical relief so late in the development of the pathologic conditions that the bladders and kidneys are extensively diseased, and the patient is manifestly exhausted by long-continued suffering, other less certain and perhaps less severe measures may be advised, instead of a complete prostatectomy; but that such a decision can only be and must always be made by the surgeon for the individual case, and cannot be made the subject of a generalization. A consideration of these other methods of treatment cannot be entered upon in this paper."

Sir William Thompson² reports 5 cases of **suprapubic prostatectomy** and discusses the various operative measures for the relief of prostatic hypertrophy. While he thinks the method followed in these cases is preferable to others, yet he states that there are cases in which the operation through the perineum may be more easy, such as in a man with a large pendulous abdomen. Small prostates may be more easily removed through the perineum, but that route is certainly unfitted for the enucleation of some of the large masses frequently met with. Particular attention is called to the following points: "(1) So far as I have seen, the lateral lobes are most frequently the cause of obstruction. I have not myself seen a true pedunculated mass producing a block at the internal orifice, although we have been in the habit of laying stress upon this as the usual cause of the urinary distress. (2) The bulk of the prostate as felt in the rectum gives us no indication as to its intravesical contour. It may present two smooth lateral masses in the bladder, with the urethral opening forming a dimple between, or it may have a somewhat undulating surface, due to the projection of adenomatous

¹ Boston M. and S. Jour., Aug. 28, 1902.

² Brit. Med. Jour., April 18, 1903.

tumors in the substance of the gland itself. No extravesical examination will determine the difference, although in cases in which the prostate is very large its general outline may be determined by a bimanual examination—two fingers of the left hand being in the rectum, and the right fingers over the bladder. (3) The size of the prostate has no necessary relation to the severity of the urinary distress. (4) The smaller the tumor, the more difficult relatively is its enucleation. Freyer has also observed this fact, and he accounts for it by the suggestion that the large tumor shakes itself free, as it were, from its natural attachments. The prostate which I exhibit, which was removed with its urethra, only took 10 minutes to enucleate. The single lobe took 25 minutes of hard work. I think the removal of the larger tumors is more facile, because they are more bulky, looser in their attachments, and therefore more easily dealt with by the forefinger when they are pressed upward from the rectum. The smaller ones are not so stable; they are apt to move much during the enucleating process. Added to all this there is no doubt that the attachments of the mucous membrane are more intimate and require a good deal of cautious force to free them." The hemorrhage which sometimes is severe from the veins of the prostate is usually easily controlled by flushing with hot boric acid solution. When this is not sufficient, Thompson employs a tampon made of a piece of smooth red rubber, which is attached at its center by means of a silk ligature to a catheter and is then drawn into the urethra. The pressure of the rubber is sufficient to arrest the hemorrhage, and it can be easily withdrawn through the suprapubic wound by a ligature which is passed through its edge. This tampon closely resembles that which is used for plugging the posterior nares.

Thorkild Rovsing¹ (Copenhagen) presents his own experience in the various methods of operating for **hypertrophy of the prostate** and strongly recommends the more conservative methods of treatment. Freudenberg, one of the strongest advocates of the Bottini operation, found that the mortality-rate in 318 cases in which the Bottini operation was done was 8.5 %. The mortality of the operation of prostatectomy is even higher. Only a small percentage of the cases treated by castration and vasectomy are permanently benefited. "Rovsing, in concluding his article, advocates that patients who are not in specially bad condition, who have only a moderate amount of residual urine, and who have intelligence and facilities for catheterization, be treated by systematic catheterization in preference to any of the operative methods. Those cases in which there is total retention or in case of severe cystitis and other complications he believes are preferably treated by suprapubic cystotomy. He performs the operation under local anesthesia with cocaine solution, inserting a drainage catheter which can be left for an indefinite time, and by the apparatus which he employs soiling of the patient's clothing is avoided. Out of a considerable number of cases in which he has employed this method of treatment none of the patients have died as result of the operation, and in many cases in which the patients were

¹ Archiv. f. klin. Chir., 1902, lxxviii, 934.

in an apparently desperate condition so complete a recovery resulted that they were able to get about and resume their employment."

In a discussion on the **treatment of chronic enlargement of the prostate** at the British Medical Association, P. J. Freyer¹ reported 7 additional cases of enlarged prostate removed by the suprapubic route. These, together with cases previously operated upon, make a total of 21. [For a description of the suprapubic operation performed by Freyer see YEAR-BOOK for 1903.] Each of the additional 7 cases was described briefly and the specimens were shown. These specimens are classified in 3 groups, as follows: "(1) Those in which the lateral lobes have separated along their superior commissures only, the prostates coming away as a whole, leaving the urethra, and probably the ejaculatory ducts in most instances, uninjured. (2) Those in which the lateral lobes have separated along both commissures and have been removed separately, leaving the urethra and ejaculatory ducts intact. (3) Those in which the lobes have not separated along either commissure, the prostate being removed as a whole, after the urethra and ejaculatory ducts had been torn across, and in some instances the prostatic urethra either partially or entirely removed. In most of the cases of this type it will be observed that the prostate is encircled by a thin girdle of fibrous and muscular tissue, part of the prostatic sheath, so that in these instances not only has the prostate in its true capsule been removed, but in addition a thin layer of the sheath outside this has also come away." Freyer has abandoned the use of any cutting instrument for dividing the mucous membrane over the prominent portions of the prostate in the bladder preparatory to the enucleation of the gland in its capsule, using instead the sharp edge of the finger-nail. He states that in the gradual enlargement of the prostate the sheath becomes thinned in the direction of the bladder till eventually the prostate bursts through its sheath in this direction and is merely covered by mucous membrane. Great care should be taken to avoid opening the true capsule of the gland, and therefore the use of scissors or the scalpel should not be recommended. If the capsule is opened, the surgeon will find himself enucleating isolated adenomatous tumors instead of the whole organ. Freyer has now performed this operation "on 21 patients, varying in age from 58 to 79 years, the prostates removed weighing from $1\frac{1}{2}$ to $10\frac{1}{2}$ ounces. All had entered on catheter life, and, save two or three, complete catheter life from a few months to 14 years. All were in broken health, some of them being almost moribund before operation. Many suffered from cystitis, pyelitis, kidney or heart disease, or some other complication. In 19 of these patients an absolute and complete cure has ensued. In one instance the patient had recovered from the operation, and was passing his urine naturally, when acute mania set in, from which he died on the twenty-fourth day. The remaining case, after progressing satisfactorily in all respects, suddenly, on the ninth day, succumbed to heat-stroke."

Alexander (New York) was the first to discuss this paper, and con-

¹ Brit. Med. Jour., Nov. 8, 1902.

fined his remarks largely to the surgical anatomy of the prostate. "He demonstrated the fact that the true capsule of the prostate was derived from the pelvic fascia, and that within this and independent of it was the secondary capsule or sheath, the so-called prostatic sheath of Thompson. He pointed out, secondly, that enlargement of the gland particularly affected the lateral lobes in front of and behind the seminal ducts, and agreed with Freyer that the so-called third lobe was always of the nature of an outgrowth from one or other lateral lobe. Thirdly, he directed attention to the important distinction from a pathologic point of view between the portion of the gland represented by the lateral lobes and that part which lies behind the urethra in front of the seminal ducts. The first was responsible for obstruction in enlargement of the gland, while it was in the latter that cancerous and other pathologic conditions most frequently originated. When the whole prostate was removed the capsule which belonged to the pelvic fascia was not taken away with it; the sheath was, however, removed. By a study of the surgical anatomy he had been convinced that for removal of the gland the perineal route was the best. He operated through a median perineal section and preserved the prostatic urethra."

Sir William Macewen inclines to the view that the perineal route in operating upon the prostate is the route of choice. He agrees that the cause of obstruction is in the overgrowth of the lateral lobes in most instances, and he has, by removing the lateral lobes through the perineum without opening the urethra, obtained very satisfactory results.

Jordan Lloyd stated that he thought it was clear that Freyer had performed two different operations; in some cases he had enucleated the lateral lobes; in others he had taken away the whole gland along with the prostatic urethra.

Parker Symms (New York) took a strong stand in favor of the perineal operation in preference to the suprapubic route for removing the prostate. The suprapubic method not only makes two wounds in the bladder-wall, but leaves a pouch from which the prostate has been removed, which pouch is drained in a most unsatisfactory manner. Symms described his own method of performing perineal prostatectomy and showed his inflatable rubber prostatic retractor [see YEAR-BOOK for 1903], which greatly facilitates the enucleation of the prostate through the perineal wound. The rubber retractor also has the advantage of preventing bleeding. Usually, but not always, the floor of the prostatic urethra is divided when the middle portion of the gland is taken out, and Symms has had all of his specimens examined microscopically and it has been shown that the mucous membrane had not been taken away except in one case, and in that but a small portion was found on the middle lobe. After the enucleation has been completed an ordinary perineal drainage-tube, No. 35 or 36 French, is employed, the wound and the space behind the bladder from which the prostate was removed being firmly packed with iodoform gauze. The tube is removed on the fifth, sixth, or seventh day, when the patient is allowed to sit up and walk about. "He has operated upon 21 patients, and has had no death immediate nor remote.

His second case was incomplete for reasons elsewhere stated. All of his other cases have resulted in practical cure, that is to say, they have been able to hold their urine, not having incontinence; and they have been able to empty their bladders, being cured of residual urine. They have been able to hold their urine from 2 to 4 hours during the day. Most of them have been able to go the night without rising; some of them have been obliged to rise once. These 21 patients have been a fair representation of the various types of this affection. They have ranged from 50 to 78 years of age. All had cystitis except one. He was operated upon during his initial attack of retention. Two of the patients had bladder stones. Some of them were very feeble old men; some of them were men in good health. One case only suffered from shock owing to a postoperative bleeding which required repacking of the wound. This is the only complication which occurred in any of these cases."

Reginald Harrison did not think that the operation as described by Freyer is entirely free from criticism in its general application to the advanced forms of prostatic obstruction. He believes that the removal of a portion of the urethra which the prostate contains is open to the objection that there is a great likelihood that cicatricial contraction will later produce stenosis of the canal, giving rise to great difficulty and the necessity of the use of the bougie. In fact, he reports a case of his own operated upon after the method of Freyer in which this did take place. It is thought that frequently it is unnecessary to remove the entire prostate, but that the offending portion can be removed by the perineal route with comparative safety and without danger to the urethra.

In closing the discussion Freyer stated that he wished to emphasize the difference between the operation which he performed and the old operation of McGill, which was but a partial prostatectomy, whereas his operation consists in the removal of the entire organ.

Ochsner¹ deals with the **indications for operation in hypertrophy of the prostate** and reports 22 cases with operation. From a study of these cases and the literature on the subject, the following conclusions are drawn: "(1) Perineal prostatectomy is indicated in all cases of obstruction due to hypertrophy which cannot be relieved for any considerable period of time by hygienic measures and medical treatment. (2) This is especially true in old men past the period of virility, because in these cases it is not necessary to preserve the seminal vesicles. (3) In younger patients more persistent efforts should be employed to obtain relief with nonoperative treatment, and in case of operation the seminal vesicles should be preserved. (4) In the presence of stone of the bladder complicating or resulting from the obstruction due to enlargement of the prostate gland, the latter should be removed and the stone extracted through the perineal wound. (5) The contraindications to the operation are (a) acute infection, (b) advanced nephritis with or without pyelitis, (c) other coexisting conditions of sufficient importance to make any major operation very unsafe. (6) If possible thorough preparatory treatment

¹ Chicago Med. Recorder, May, 1903.

should precede the operation. This should consist in hygienic measures, rest in bed, drinking distilled water, irrigation of the bladder, and the administration of nonirritating remedies which have a tendency to render the urine sterile. (7) In case the obstruction is complete and catheterization impossible because of the obstruction or on account of the resulting hemorrhage, an immediate operation is indicated. (8) The operation should be performed before patients have advanced to this condition."

N. P. Dandridge¹ discusses the **present status of treatment of hypertrophy of the prostate**, describing a number of cases operated upon. The author takes the stand that although, of course, there are many cases in which prostatectomy is indicated and should be performed, especially those complicated by stone, yet it is thought that the tendency to operate is too prevalent. He is convinced that in the largest proportion of cases of hypertrophy the proper and judicious use of the catheter is to be preferred to operative measures. Perineal drainage for some weeks will often yield favorable results. Perineal prostatectomy is the preferable method of removing an enlarged prostate, but should not be postponed too late. The operation should be considered a grave surgical procedure and not recommended hastily.

After the discussion of the **symptoms of prostatic hypertrophy, their cause and relief**, Edward L. Keyes, Jr.,² presents the following conclusions: "(1) Chronic obstruction to urination is the underlying cause of almost all the symptoms attributable to hypertrophy of the prostate gland. (2) This obstruction may be regarded as an elevation of the internal orifice of the urethra. (3) Yet obstruction may exist without symptoms, and symptoms without obstruction. (4) For the immediate cause of all the symptoms is congestion. (5) Hence to the patient the disease represents only a congestion. (6) While to the surgeon it represents, for the most part, an obstruction, an elevation of the urethral orifice. (7) The symptoms may often be relieved by relief of the congestion without regard to the obstruction. (8) Yet such treatment is purely palliative and is not the function of an operation. (9) Radical treatment consists in permanent relief of the obstruction in the floor of the urethra with little regard to congestion. (10) This may be accomplished by cauterization or extirpation of the offending mass through a perineal or a suprapubic incision. (11) The operation to be preferred must attack the obstacle most directly, and remove it most rapidly, while preventing hemorrhage and providing perfect drainage. (12) Of the operations employed at the present day, the one which most often fulfils these conditions is perineal galvanoprostatotomy."

PLASTIC SURGERY, BURNS, ULCERS, AND GUNSHOT WOUNDS.

Bardellini³ presents an interesting report of **gunshot wound of the cervical portion of the vertebral column**. The patient was a boy,

¹ N. Y. Med. Jour., Jan. 3, 1903.

² Phila. Med. Jour., Dec. 6, 1902.

³ Riforma Medica, May 6, 1903.

aged 16 years. The bullet entered the mouth, injuring the teeth and tongue, and lodged between the fourth and fifth cervical vertebrae. At first the patient presented the symptoms of cerebral concussion, but later developed an inability to move the head because of pain and rigidity in the neck. When the head was bent forward, the patient complained of a sensation like an electric current passing through the entire body, especially marked in the lower limbs. There was tenderness on pressure of the right side of the neck in the region of the thyroid cartilage. A skiagraph was made, which showed the bullet lodged in the space between the fourth and fifth vertebrae. As no improvement had taken place after the twenty-third day, it was decided to remove the bullet. The pharynx was exposed through an incision extending along the right sternocleidomastoid muscle. When the pharynx was opened, the course taken by the bullet could be easily determined. It was found in the position indicated by the skiagraph and was removed. The pharynx was closed with a catgut suture and the wound in the neck was closed with sutures of silk. Infection took place, having its origin in the pharyngeal wound, and allowed the escape of food into the wound. After drainage, however, the wound closed and the patient recovered. Bardellini thinks that the sensation complained of by the patient and produced by flexion of the head was due to the laceration of the intervertebral ligaments and a resulting displacement of the vertebrae in such a manner as to compress the special nerve-roots. Another case operated upon by the author is referred to, in which esophagotomy was done for the removal of a foreign body and the esophageal wound closed. In this case also infection took place. These two cases confirm the advice of those authorities who recommend tamponage of esophageal wounds.

A discussion of **gunshot injuries of the skull and brain** based upon the study of 30 cases occurring during the South African war is presented by Irving.¹ It is stated that the majority of the deaths occurring on the battle-field were results of wounds of the skull and brain. Those of the thorax rank next as a cause of immediate death. It is said that 7 out of 10 penetrating gunshot wounds of the skull are immediately or rapidly fatal. Notwithstanding these statements, the percentage of recoveries in this class of injuries has been surprisingly large when compared with former wars. This is not only due to the systematic use of antiseptics, but also, and in a much greater degree, to the properties of the small-bore bullet, its high penetrating power, its slighter liability to distortion, and its general initial asepticity. Irving states that he has observed 12 cases in which recovery took place after complete perforation of the cranial cavity. Solid small-bore bullets are capable, if at close range, of producing considerable explosive action. These effects are more marked when the bullet comes in contact with the shafts of the long bones and are less marked in the skull. All gunshot fractures of the base involving the middle or posterior fossa, or both, with penetration of the cranial cavity and base of the brain, are at all ranges either immediately or ultimately fatal. As the range at which the wound is

¹ Lancet, Oct. 25, 1902.

inflicted increases, the character of the injury becomes progressively less severe. A description is given of gutter fractures and of superficial and deep perforating fractures. Seven out of the 9 cases of deep perforating fractures reported by Irving recovered. Six of these patients were followed up for at least a month after operation; at this time they could talk quite intelligently about their wounds and their experiences, but the power of continued mental exertion was soon exhausted. One interesting case is recorded in which a soft-nosed Mauser bullet entered the skull through the malar and sphenoid bones, struck the petrous portion of the temporal, glanced and struck the vertex of the skull, was again deflected, and lodged in the motor area. The interesting point in this case is that, although the bullet was a so-called expanding bullet, it did not expand. This patient died.

G. R. Fowler¹ presents the notes of a case of **gunshot wound of the neck**. The bullet entered the mouth and lodged beneath the skin at the posterior border of the sternomastoid muscle. In its transit the bullet tore away a portion of the left side of the tongue. The tongue was sutured and the track of the bullet was packed. On the sixth day after the injury there was a profuse hemorrhage which caused the tampon in the track of the bullet to be forced into the mouth. About an hour after the onset of hemorrhage, and when it had been partially controlled by packing, Fowler exposed the common carotid artery and passed under it two ligatures, one of which was twisted just sufficiently to control the blood-current without undue pressure of the arterial coats. The weight of the forceps was sufficient to prevent the untwisting of the ligature. An incision was then made in the neck, the bullet removed, a quantity of blood-clot cleaned out, and the bleeding point readily discovered when the pressure upon the carotid was slightly relieved. The bleeding vessel was the facial, which was ligated. The ligatures were removed from the carotid, and, no bleeding occurring, the lower wound was closed and the upper wound drained. Six days later and 12 days after the receipt of the injury, another profuse hemorrhage took place, and again the common carotid was exposed and the blood-current controlled in the same way as on the first occasion. The bleeding at this time apparently came from the ascending pharyngeal, which, however, could not be ligated because of the distortion of the parts due to inflammatory exudate. Because of the septic conditions overlying and surrounding the bifurcations of the common carotid, ligation of the external carotid was out of the question; therefore a ligature was placed about the common carotid. The bleeding ceased at once, but, owing to the freedom of anastomosis between the external carotids, it was thought wise to ligate the external carotid of the opposite side, which was done at once. The patient made a slow but uninterrupted recovery.

W. L. Rodman² discusses **gunshot wounds of the thorax and abdomen** from the standpoint of the civil surgeon. The diagnosis of penetrating wounds of the thorax is not difficult, as a rule, and should always be made without the use of the probe. The amount of external hemor-

¹ Brooklyn Med. Jour., Feb., 1903.

² Jour. Am. Med. Assoc., Feb. 14, 1903.

rhage in such cases is usually small. Hemothorax is apt sooner or later to develop, and is usually due to an injury of the intercostal vessel. Rodman states that unless the patient succumbs within a short time to hemorrhage the prognosis is good, provided the wound has not been interfered with. Numerous instances are reported of recovery from penetrating wounds of the chest, and in fact recovery is the rule if patients do not die immediately from shock or hemorrhage. The treatment in such injuries should be confined to cleansing the skin about the wounds and thoroughly immobilizing the chest and keeping the patient quiet with opium. Suppuration as a subsequent complication is not likely to occur unless some portion of the clothing has been carried into the lung. It is shown that the bullet itself is not likely to set up suppurative inflammation. Any attempt to remove the ball from the lung is accompanied by great danger and is rarely justifiable.

Attention is called to the fact that pistol-shot wounds of the abdomen may occur without perforation of a viscus, a number of such cases having been reported. Penetration without perforation is extremely rare in civil practice. Contrary to what has usually been taught, extraperitoneal wounds of either the intestines or bladder are more fatal than intraperitoneal wounds. Attention is called to the improvement recently made in the recovery-rate after operation for penetrating gunshot wounds of the abdomen. Rodman insists on as early a laparotomy as is consistent with the environment and conditions of each case. Frequently there is little extravasation of intestinal contents until the abdomen has been opened and the intestine handled; hence it is recommended that when operating upon these cases each aperture should be protected with gauze as soon as it is encountered, and the openings as quickly closed as possible. It is the author's belief that drainage should very generally be employed in shot wounds of the abdomen. It is a mistake to wait for the subsidence of shock or its amelioration before opening the abdomen in these cases. Rodman protests against the idea that celiotomy should be performed regardless of environment and the ability of the operator. Inexperienced and timid men may, from a false sense of duty, operate on such cases when their lack of training, want of assistants, and inadequate facilities foretells disaster to their patients. Abstention from all food and drink, with opium to check peristalsis early in the case, will save more cases than reckless operating.

LaGarde¹ discusses **gunshot wounds of the chest and abdomen** from the military standpoint. The treatment of such wounds is not the same in military practice as in civil practice. This is largely due to the difference in size, composition, and velocity of the projectiles and to environment, transport, and morale. The greatest resistance in tissue wounds comes from compact bone, like that encountered in the shaft of the long bones, and from water. The remarkable escape from injury of the heart, the great vessels, and the esophagus in penetrating wounds of the chest is due to the loose cellular tissue which permits displacement at the moment of impact. This change in position is more apt to occur

¹ Med. News, Nov. 15, 1902.

when the remaining velocity of the bullet is low. Reference is made to two cases occurring in the Philippine Islands in which the bullet passed through the chest and in which the escape of the heart and large blood-vessels was remarkable. Wounds of the lung made by the modern bullet almost invariably recover, except in those instances in which the missile cuts one of the large vessels. The mortality from penetrating gunshot wounds of the chest during the Civil War was 62.5 %, whereas during the recent war with Spain and in the Philippines they presented a mortality of 27 %. In the Surgeon-General's Report for 1900 there are recorded 116 cases of penetrating gunshot wounds of the abdomen which were submitted to operation, with a mortality of 70 %, and the large majority of the 30 % that recovered sustained no injury of the intestine. The success of celiotomy for gunshot wounds during war will largely depend upon the confidence and skill of the operator and the nature of the environment. In order to accomplish successful abdominal work in war it will be necessary to use a great deal of forethought so that the operators may not be hampered by the endless difficulties which are apt to occur in active campaign.

A lengthy discussion is presented by Louis A. LaGarde¹ on **poisoned wounds in warfare**, with the following conclusions: The custom of poisoning implements of warfare is shown to have been practised from the most ancient times to the present day, by the employment of not only vegetable but also of bacterial poisons. By experiments LaGarde has shown that the explosive and the ball are contaminated, the first in 12 % and the latter in 47 % of instances. The wad and wadding materials are always contaminated. It is also shown that the bacteria existing in the powder, the wad, on the ball or in the barrel of the gun are not destroyed either from the heat generated by the firing or from the friction. LaGarde also believes that there is nothing in the act of firing to destroy the lethal properties of vegetable poisons, and that these are readily conveyed into wounds when they are placed in the powder, on the ball, or in the barrel. Animal poisons, such as snake-venom, can be conveyed in the same manner. The above facts can be so easily proved that it becomes the duty of the surgeon in all criminal attempts to make a thorough investigation of the weapon, and the following rules are suggested: (1) If powder grains are found in the clothing or wound, they should be carefully collected for examination. (2) The projectile inflicting the wound when recovered should be at once dropped into mediums with sterile forceps. (3) If the wound has been the result of a ricochet shot, the point of impact before penetrating the skin should be examined for the presence of poison. (4) The inside of the barrel of the weapon should be examined for specific microorganisms. (5) The examination should also include a thorough study of all the ammunition remaining in the weapon. (6) The same steps should be observed in examinations for the presence of toxins, animal and vegetable poisons.

Charles Roberts² discusses the **treatment for abdominal wounds in**

¹ Jour. Am. Med. Assoc., April 18, 1903.
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² Brit. Med. Jour., Oct. 4, 1902.

war and reaches the following conclusions: "(1) That as a rule the conditions in a field hospital are not suitable for performing laparotomy. Moreover, many patients with penetrating abdominal wounds recover without operation, and in the majority of those who die the nature of the injury is such that death must result whatever be the conditions of operation, and an exploratory laparotomy may add a fresh danger to the patient. (2) When occasions arise in which the conditions of operation approximate to those in civil practice laparotomy should be undertaken for increasing intraperitoneal hemorrhage endangering life, and when there is evidence that perforation of the stomach or bowel probably exists, provided that the patient is seen early enough."

Amyx¹ reports a case of **gunshot wound of the abdomen** in which there were 19 perforations of the intestine and 4 lacerations of the mesentery. A number of these perforations were closed and 11 inches of bowel, which contained 12 perforations, resected, and an anastomosis



Fig. 58.—Richards's case of accidental gunshot-wound of chest: A, Wound of entrance; B, wound of exit (Amer. Med., Feb. 21, 1903).

done with a Murphy button. Besides perforations of the small intestine, the cecum, ascending colon, and sigmoid were also perforated. The operation was performed 2 hours after the receipt of the injury. After the repair of the wounds and resection of the bowel the abdominal cavity was thoroughly irrigated with salt solution and a number of gauze drains introduced. The time of the operation was 3 hours. Except for the development of a gluteal abscess, the patient's convalescence was satisfactory. The abscess resulted from the bullet, which was removed when the abscess was opened.

Richards² reports a case of an American soldier who accidentally **shot himself through the left chest**. The points of entrance and of exit of the bullet are indicated in the accompanying illustration (Fig. 58). The patient bled profusely from the wounds at first and also expectorated considerable blood. The area of skin about the wounds was thoroughly

¹ Med. Rec., Sept. 20, 1902.

² Amer. Med., Feb. 21, 1903.

cleansed and an antiseptic dressing applied. The patient later developed traumatic pneumonia, which gradually subsided, and he recovered. In less than two months he returned to duty. During his convalescence gymnastic lung exercises were employed to reestablish expansion.

Collier¹ discusses the **relationship between nasal obstruction and deformities of the upper jaw, teeth, and palate**, and presents a number of casts illustrating his views. In the first place, the author's communication tends to show that in impeded nasal respiration there is a difference in the pressure on the outside of the young and growing skull, altering and affecting the curve of the upper jaw and the shape of the face and palate. It is shown that in young animals the nasal cavities of which have been obstructed for the purpose of scientific observation, a profound alteration takes place in the development of the upper jaw, and a marked alteration in the curves of the alveolar arch, and in the position and height of the palate. Collier believes that heredity has nothing to do with these changes, as is shown by the fact that they are not present in infancy, but take place later in youth. The effect upon the bone is produced by the passage of air through the mouth, which abstracts the contents of the nasal chambers and so produces an increased pressure of the nasal box. This increased pressure not only pushes up and elevates the hard and soft palate, but it squeezes and approximates the halves of the upper jaw, thus impeding its development. Professor Ziem, in his experiments upon animals, has shown the truth of this explanation. If a manometer be connected with the nose and fitted accurately during each oral inspiration, the mercury will ascend in the proximal limb; this is considered by the author as an absolute proof of his theory.

The use of **paraffin in plastic surgery** is dealt with by Paget,² who devotes particular attention to the technic and to the improvement of deformed noses and prolapse of the rectum. But one serious disaster has been traced to the use of paraffin, a case of pulmonary embolism. The greatest care should be practised in the preparation of the paraffin and in the selection of the syringe. A leak or a crack in the syringe or the setting of the paraffin before the injection is completed ruins the whole operation. Paget believes that the best paraffin is that which has a melting-point somewhere between 108° and 115° F. When the paraffin must stand heavy and immediate pressure, the higher melting-point is preferable. In the injection into the loose submucous tissue an ordinary antitoxin syringe is satisfactory, but in the nose cases an especially well-made and tight syringe with its needle attached by a screw is to be preferred. It is also well to have two syringes in case an accident happens. Paget has operated upon 43 cases of deformed noses, and in no case has there been a death, embolism, sloughing of the skin, or wandering of the paraffin. The results have varied from very good to indifferent, but the large majority has been satisfactory. It must be remembered in these cases that only when the skin over that portion of the nose which is to be raised is fairly movable is the paraffin injection possible. This bars, of course, those cases in which depression is covered by cic-

¹ Lancet, Oct. 18, 1902.

² Lancet, May 16, 1903.

tricial skin which is tightly bound down. Just before injecting the paraffin the needle should be dipped for 6 or 8 seconds in water that is boiling or just off the boil, in order to prevent the setting of the paraffin in the needle. The greatest care should be exercised by the assistant to prevent the paraffin settling in the forehead, the eyebrows, the inner angles of the orbits, and the side of the nose. Paget makes the injection at the lowest point of the depression. The molding should be vigorous, and while it is being done cold water should be allowed to trickle over the nose. The patient is, of course, etherized. Paget has had 3 cases of prolapse of the rectum in old people in whom he has obtained good results from paraffin injection.

Walsham¹ discusses some operations for **rectifying crooked and depressed noses**. He states that crooked noses often are not the result of fracture of the nasal bones, but their bodily displacement at the fronto-nasal suture. This, however, does not appear to be true when the patient is looked at from the front, as the anterior or cartilaginous portion of the nose is generally at the same time deflected in the opposite direction. For these cases forcible straightening is generally insufficient, and for correcting the deformity Walsham recommends a subcutaneous osteotomy of both bones along the nasomaxillary suture. This can be done through a small skin incision and with a mastoid chisel. If thoroughly replaced, the tendency to recurrence of the deformity after one or two days is not great. Subcutaneous suture of the lateral nasal cartilages is then spoken of, the author stating that he has had good results from wiring the cartilage to the nasal bone when it has been displaced. Occasionally it is necessary to remove the ends of the overlapping nasal bones. His results from the use of paraffin have been very satisfactory and permanent. Walsham also recommends shifting the septum bodily at its juncture with the floor of the nose in cases of harelip, where it is found fixed out of the median line. This operation he believes to be original with himself. Another operation is referred to, that of forming a septum by elevating the maxillary crests in depression of the bridge due to necrosis.

Moszkowicz,² who is a colleague of Gersuny, discusses the **injection of paraffin for the correction of deformities** and compares the use of **hard and soft paraffin**. Gersuny and the author have employed paraffin injections in 28 cases of deficient nasal bridge and for numerous other conditions. They always employ the soft paraffin, the melting-point being from 36° C. to 40° C., which at ordinary temperatures is of the consistence of lard, and after heating can be expressed through the finest hypodermatic needle. Eckstein has presented 3 objections to the use of this soft paraffin: he states that it may be absorbed; that it may migrate from the point of injection; and that it may produce embolism. Stein supposes that the paraffin is slowly absorbed and replaced by connective tissue. The author, however, proves that this is not the case, but that the paraffin becomes encapsulated. About 10 weeks after injection there is a small-celled infiltration around the mass, and if the injection is made into cicatricial tissue numerous giant-cells are found.

¹ Lancet, April 4, 1903.

² Wien. klin. Woch., Jan. 8, 1903.

The second objection of Eckstein is true, but Moszkowicz states that it has not been proved that the same objection cannot be made to the harder paraffin. He does not think that the soft paraffin is more likely to produce embolism than the harder variety. Reference is made to a case reported by Pfannenstiel in which paraffin with a melting-point of 45° C. was injected for the cure of incontinence of urine in a woman, and in which pulmonary embolism followed. The author has seen 2 cases of pulmonary embolism occur from the injection of Gersuny's soft paraffin when the injection was made without special precautions into the perivaginal tissue and the parametria for prolapse of the uterus. Both of these patients, however, recovered. The danger of embolism can be eliminated by first injecting Schleich's solution and then redrawing a portion of the fluid into the syringe. If blood is withdrawn, the needle is in a vein and the paraffin should not be injected; if, however, no blood is withdrawn a second syringe containing the paraffin may be attached to the needle and the injection proceeded with. The white German paraffin may be sterilized by boiling and drawn into the syringe while liquid; when it has cooled it is injected. Moszkowicz has in 2 cases of progressive facial hemiatrophy injected a mixture of 1 part of soft paraffin and 4 parts of olive oil with advantage. When this method is employed, a number of injections are required. In two cases in which the synovial membrane had been removed because of tuberculous disease a quantity of melted paraffin was poured between the articular surfaces to prevent ankylosis, and in each case a movable joint was obtained.

Francis Alter¹ suggests a **modification in the technic of injecting paraffin for saddle-nose**. He reports a case of his own in which the muscular action of the alæ of the nose was interfered with to such an extent that the patient instead of breathing naturally through the nose was obliged to breathe entirely through the mouth. The condition, however, was remedied by removing the inner posterior lateral portions of the alæ. In order to prevent the infiltration of the paraffin far enough down to interfere with the action of the alæ, it is suggested that these portions of the nose should be compressed between the thumb and forefinger of an assistant on each side at the time the injection is made.

F. B. Lund² reports numerous cases of **congenital abnormalities of the phalanges**, presenting photographs and skiagraphs. An interesting point in the cases reported is the tendency of these deformities to be transmitted from parent to child.

Keetley³ makes a second report of a patient on whom he performed what he calls "**transplantation by exchange**." The operation was one for a large hairy mole on the cheek of an infant 2 or 3 weeks old. The operation consisted in strapping the arm to the side of the face, dissecting the mole from the cheek, except at one point, in taking a flap from the arm corresponding to the area exposed on the cheek, and in fixing the mole to the arm and the flap to the cheek. Later, the bases of the mole and of the flap were divided, and a very excellent result was obtained.

¹ Amer. Med., Nov. 22, 1902.

² Boston M. and S. Jour., Dec. 11 and 18, 1902.

³ Lancet, Nov. 22, 1902.

Flegenheimer¹ reports a **successful case of pig-skin grafting**. The patient had suffered the loss of about one-third of the skin and subcutaneous fat of the arm and forearm. Numerous grafts consisting of the full thickness of the skin taken from the belly of a healthy young pig were placed upon the granulating area, and nearly all of them lived. The entire wound was soon covered with healthy skin which presented a growth of fine hair.

X-RAYS.

For x-ray in treatment of tumors, see section on cysts and tumors.

William Rollins² contributes some **notes on x-light**. "The x-light tube must be in a nonradiable box from which no x-light can escape except the smallest beam that will cover the area to be examined, treated, or photographed. The box must have a nonradiable diaphragm plate, the opening in which can easily be adjusted, while looking in the fluoroscope, until the beam of light is the smallest that will cover the area under examination. The cryptoscope must have a plate of heavy lead glass to absorb the x-light which has passed unchanged through the fluorescent screen, to prevent injury to the observer's eyes. The walls of the cryptoscope must be made of nonradiable material. The patient should be covered during photographic exposures with a nonradiable sheet, exposing only the necessary area. An experimenter who works much with x-light should use a nonradiable face mask, the eyeholes of which are glazed with thick plates of heavy lead glass. In using the cryptoscope, while testing the tube during pumping and tuning, he should not use his hand for examination, but should attach to the cryptoscope a Röntgen gauge and a Williams fluorometer for determining the penetrating power of the x-light and its brightness. The hand that holds the cryptoscope should be protected with a nonradiable covering. During the pumping and tuning of x-light tubes, they should be kept in an oven with nonradiable walls." Experiments on animals prove that not only may the x-rays burn or blind, but they may also kill. All apparatus used about patients during applications should be of material which will allow sterilization.

Edward A. Tracy³ reports 3 cases in which he utilized **actinic rays for anesthetic purposes** during minor operations.

G. C. Burdick⁴ read a paper on **radiotherapy in tuberculosis** before the American Röntgen Society, December 10 and 11, 1902. Much of his work was based on a series of experiments conducted on guineapigs inoculated with the tubercle bacillus. He found that when a culture of the bacillus is exposed to the Röntgen ray its development is checked considerably, although in every case it failed to kill the germ. Pigs exposed to the ray lived much longer than pigs not so exposed. When the ray was used in cases of tuberculosis in man, a slow but certain improvement took place, and eventually a good recovery. Cases of fibroid tuberculosis yielded very slowly. Abdominal tuberculosis requires longer treatment than the pulmonary form. In a few cases a

¹ Virginia Med. Semi-Monthly, June 26, 1903.

² Boston M. and S. Jour., April 2, 1903.

³ Boston M. and S. Jour., Nov. 6, 1902.

⁴ Jour. Am. Med. Assoc., Jan. 17, 1903.

tendency to relapse has been noted. In the cases of mixed infection improvement is delayed and there is a very marked tendency to the sudden development of toxemia. Joint tuberculosis, in which only the bones are involved, offers the best results, but permanent relief cannot be obtained until complete ankylosis has occurred, and the author advises that nothing should be done with the x-ray until this ankylosis has occurred. He used the ray in a total of 43 cases of tuberculosis in all parts of the body with uniformly good results, except in one case, in which death occurred. This was a case of advanced general tuberculosis, and even here the improvement was at first marked.

Milton Franklin¹ concludes that a **phototherapeutic apparatus** should fulfil the following conditions: "(1) It should be supplied with light by artificial means. (2) The lamp should be as powerful as the circumstances will permit, as no arrangement of lenses or reflectors will coax power out of a feeble lamp. (3) The lamp should be an electric arc using chemically prepared electrodes calculated to produce a spectrum powerful in the ultra-violet. (4) All lamps of the incandescent principle, of whatever design, should be avoided. (5) Condensing and collecting lenses should be as large as the nature of things will permit, and should be made of rock-crystal or of some medium equally diaphanous to the chemical rays. (6) The cooling apparatus should consist of a layer of water containing no other substance and sufficiently thick to absorb the greater proportion of heat-rays. It should be inclosed in some kind of a vessel which will not interfere with the passage of the chemical rays. (7) The machine should be mounted to enable the operator to adjust and turn it in any direction with the utmost degree of precision."

Sir William Crookes² says: "The emanations from **radium** are of three kinds, one set is the same as the cathode stream now identified with free electrons—atoms of electricity projected into space apart from gross matter—identical with matter in the fourth or ultragaseous state, Kelvin's satellites, Thomson's corpuscles or particles, disembodied ionic charges retaining individuality and identity. Electrons are deviable in a magnetic field and are shot from radium with a velocity of about two-thirds that of light, but are gradually obstructed by collisions with air atoms. Another set of emanations from radium are not affected by an ordinarily powerful magnetic field, and are incapable of passing through very thin material obstructions. They have about 1000 times the energy radiated by the deflectable emanations. They render air a conductor and act strongly on a photographic plate. These are the positively electrified atoms. Their mass is enormous in comparison with that of the electrons. A third kind of emanation is also produced by radium besides the highly penetrating rays which are deflected by a magnet: there are other very penetrating rays which are not at all affected by magnetism. These always accompany the other emanations and are Röntgen rays—ether vibrations—produced as secondary phenomena by the sudden arrest of velocity of the electrons by solid matter, producing a series of Stokesian 'pulses' or explosive ether waves shot into space.

¹Med. News, Sept. 20, 1902.

²Lancet, May 23, 1903.

These rays chiefly affect a barium platinocyanid screen and only in a much feebler degree zinc sulfid. Both Röntgen rays and electrons act on a photographic plate and produce images of metal and other substances inclosed in wood and leather and shadows of bodies on a barium platinocyanid screen. Electrons are much less penetrating than Röntgen rays and will not, for instance, show easily the bones of the hand. A photograph of a closed case of instruments is taken by the radium emanations in 3 days and one of the same case by Röntgen rays in 3 minutes. The resemblance between the two pictures is slight and the difference great. The action of these emanations on phosphorescent screens is different. The deflectable emanations affect a screen of barium platinocyanid strongly, but one of Sidot's zinc sulfid only slightly. On the other hand, the heavy, massive, nondeflectable positive atoms affect the zinc sulfid screen strongly and the barium platinocyanid screen in a much less degree. If a solid piece of radium nitrate is brought near the screen and the surface is examined with a pocket lens magnifying about 20 diameters scintillating spots are seen to be sparsely scattered over the surface. On bringing the radium nearer the screen the scintillations become more numerous and bright, until when close together the flashes follow each other so quickly that the surface looks like a turbulent luminous sea. It seems probable that in these phenomena we are actually witnessing the bombardment of the screen by the positive atoms hurled off by radium with a velocity of the order of that of light; each scintillation rendering visible an impact on the screen and becoming apparent only by the enormous extent of lateral disturbance produced by its impact. In the same way, individual drops of rain falling on a still pool are not seen as such, except by reason of the splash they make on impact, producing ripples and waves in ever-widening circles. A convenient way to show these scintillations is to fit the blende screen at the end of a brass tube with a speck of radium salt in front of it and about a millimeter off and to have a lens at the other end. Focusing, which must be accurately done to see the best effects, is accomplished by drawing the lens tube in or out." Sir William Crookes proposes to call the little instrument designed for this purpose the "spinthariscopes" from the Greek word *σπινθαρῖς*, a scintillation.

M. A. Cleaves¹ describes a **portable and easily adjusted lamp for producing actinic rays**. It is modeled after the one devised by Bang, and consists of water-cooled iron electrodes inclosed in a metal chamber which has two openings, into one of which is fitted a water-cooled chamber with quartz lenses, and into the other a sliding colored window which allows the operator to govern the intensity of light and to treat such conditions as require a direct exposure to the light. The conducting wires and the tubes for water pass through a hard-rubber handle. The electrodes may be arranged for any intensity of light.

T. W. Brockbank² reports 2 cases in which he used **ultra-violet ray anesthesia** successfully for minor operations. The area to be operated upon was exposed for 15 minutes to the rays of a No. 4 Munnin lamp.

¹ Med. Rec., March 28, 1903.

² Amer. Med., April 25, 1903.

C. O. Files¹ describes a new **high-frequency apparatus**. It consists of a mica tube about 10 inches long into which are screwed 20 brass knobs at intervals of half an inch, the screws projecting into the hollow part of the tube. The wire from the positive pole of a static machine is fastened to the knob at one end of the tube and a wire from the negative pole is fastened to the knob at the other end. A brass sliding rod with a depression in the upper side for contact with the screws fits into the mica tube. The static spark leaps from one knob to the next until it reaches the end of the rod; making a strong current with a great number of interruptions. When the rod is pushed into the tube, the spark-gap is lessened and the number of interruptions is decreased.

G. W. Crile² reports a case in which an **x-ray picture of a calcified aorta was mistaken for a foreign body**. The patient thought he had swallowed a set of false teeth and made numerous attempts to dislodge them, lacerating the lower pharynx. A skiagram showing a dark shadow at the lower end of the esophagus, an operation was performed and the esophagus found to be empty. A postmortem examination revealed the cause of the shadow in an extensive calcification of the aorta.

Rutherford³ announces important discoveries relating to "**thorium emanations**." "Thorium is one of the rare metals which has a power of emitting rays similar to those which come from radium. They are invisible, but will reduce the silver salts of a photographic plate. These rays when passed over red-hot lead chromate and through boiling nitric acid are unaffected, there being no chemical reaction. This led to the view that the emanations might be of the nature of gases similar to those which have been recently discovered in the atmosphere, and which it is almost impossible to combine chemically. Upon cooling the tube, through which these rays passed, with liquid air it was found that the emanations were condensed in the tube. This was determined by a galvanometer. The emanations were discharged in such a way that they made a circuit between two electrically charged plates, the current being registered by a delicate galvanometer. As soon as the tube was cooled by liquid air the current ceased, showing that whatever had been passing through the tube was condensed. Afterward the tube was removed from the liquid air and allowed to get warm. When the temperature had risen to a certain point the galvanometer suddenly registered a stronger discharge than any previously obtained. The emanations were condensed inside the sealed tube and kept for almost a week. These experiments seem to prove that these emanations or corpuscles have some of the characteristics of ordinary gases. Thomson calls these emanations of radioactive substances electrons. An electron is about the $\frac{1}{1836}$ part of the hydrogen atom, and these masses start from the negative pole in a vacuum tube with a velocity half that of light. Electrons emanating from radioactive bodies behave like particles of matter partaking of the properties of a fog or mist, and are capable of being diffused away in the free air like odoriferous substances."

¹ Med. Rec., April 18, 1903.

² Cleveland Med. Jour., Dec., 1902.

³ Montreal Pharm. Jour., Dec., 1902.

OBSTETRICS.

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PRELIMINARY AND GENERAL CONSIDERATIONS.

The Midwives Act and the Teaching of Obstetrics.—In his introductory address to a course of lectures on Obstetrics at the Owens College, Manchester, W. Japp Sinclair¹ made several references to the Midwives Act, recently adopted in England, and to the work which lies before the Central Midwives Board, of which he is a member. The Act, it will be remembered, only came into force on April 1, and the board has consequently not yet had time to complete the large body of rules, the making of which may be said to form its first duty, and these, when framed by the board, must be approved by the Privy Council, which is to consider any representations made with regard to them by the General Medical Council. Sinclair was therefore precluded from speaking in detail of the work done and to be done by the board, but he was able to forecast in general terms the changes which the Act might be expected to bring about. With regard to the midwives themselves, he looked to the Act as destined ultimately to abolish the "Gamp" throughout the country, removing the practice of midwifery from the hands "of the illiterate widow, the elderly housemaid, the innominate drudge of country districts," and placing it, so far as it is to be practised by persons not members of the medical profession, in the hands of those who, he submitted, should not be altogether illiterate. For example, he suggested that the certified midwife should be able to read a manual, to write a report of a case, and to have such acquaintance with the rule of three as to enable her to prepare an antiseptic solution or to dilute a baby's milk in the same degree on two successive occasions. The Act itself Sinclair evidently looked upon as far from perfect, although capable of amendment and improvement, but he expressed the belief that the changes brought about by it might in the future be found to exercise considerable influence upon the teaching of obstetrics in medical schools. In considering the course of training generally adopted in England for this branch of medical study, he drew unfavorable comparisons between English practices and the superior efficiency which he claimed for German methods. The Midwives Act is beyond question a measure

¹ *Lancet*, May 16, 1903.

which leaves to the board which it has brought into being a very wide discretion in the framing of the regulations by which alone the Act will become effective, and many will study these with interest besides the class directly concerned in them. [Although we have referred to the Act as having come into force on April 1, that date only marked the commencement of the powers of the board, the most immediate duty of which consists in the framing of rules. It is not until April 1, 1905, that a midwife not certified under the Act is precluded from taking or using the title of midwife or any name implying that she is certified under the Act, and consequently there is no immediate urgency for the certification and registration of those who are permitted by the Act to be certified without being examined under the regulations of the Central Midwives Board. They have to comply with the necessary formalities in the course of two years from the date of the Act coming into operation, but are not obliged to do so before. It is not until April 1, 1910, that every woman practising as a midwife will have to be certified. As, however, the women who may desire admission to the roll of midwives by means of the training and examinations to be imposed by the board will require time in which to prepare themselves, that body is no doubt proceeding as rapidly as circumstances will permit with the framing of the necessary regulations.]

The Lessened Birth-rate.—[In view of the alarmist tendency of one or two recently published papers on the falling birth-rate, it is perhaps worth while to look at another aspect of the question. To some extent this has already been done in the editorial columns of the "Journal of the American Medical Association."¹ Attention has been called to the unreliability of the data on which much of the pessimistic deduction has been made, and to the fact that a falling birth-rate and death-rate were both accompaniments of thrift and easy circumstances in a population.] A. L. Benedict² handles the subject elaborately. He shows that a diminished birth-rate depends on many factors, and not all of them, or those most efficient, are necessarily immoral or objectionable. The advance in the age of matrimony during the past century is alone effective, he holds, in reducing the birth-rate nearly 50 %, and he quotes genealogic records to show that the high birth-rate of earlier generations was associated with an equally high death-rate, and possibly with a degeneracy that tells on the prolificity at the present. If our grandparents, he suggests, had not overtaxed their reproductive powers their descendants might perhaps have been more numerous. Moreover, the extinction of well-known families cannot be credited altogether to lowered fecundity; in many cases the descendants are still numerous under other surnames. Sociologically, the fact that the well-to-do multiply scantily has a comparative tendency; it affords a chance of social circulation from below upward. Society dies at the top, but grows upward from the roots. [Some of his arguments may not be as valid as others, but there is no doubt that there is something to be said on the side opposed to the alarmists of the present day. Their charge, sometimes openly made, and

¹ July 5, 1902.

² Med. Times, May, 1902.

more often implied, that the reduced fecundity in this or other countries is the result of criminal or quasi-criminal practices is not provable, and, we believe, is mainly if not altogether unjust. The proletarian who brings children into the world to an inevitable inheritance of disease and misery, if not to actual crime, may also be regarded as criminal, far more so, indeed, than those who by self-restraint or by any legitimate means refrain on prudential grounds from having children. We may regret that this is sometimes done from mistaken and sordid motives, but we must recognize that there is more than one way to view the matter, and that it is probable, indeed, almost certain, that there has been a vast amount of pessimistic deduction from extremely imperfect data. The American race is neither decadent nor dying out, and in many sections of the country is probably nearly or quite as prolific as ever. In the New England States the American population of the post-reproductive ages is much greater than in other sections, and we doubt very much if the birth-statistics are reliable in some others where they are reported as indicating a decidedly decadent tendency. Deductions from statistics of the private practice of specialists are especially liable to be misleading unless the greatest care is taken to allow for possible errors, and records of the remote past are obviously too imperfect for reliable comparison. Families died out then as they do now, and any extensive and elaborate genealogic tree would show a proportion of unfertile marriages and minimal families that might perhaps seriously reduce the average. The "died in infancy" list would be found vastly larger than is the rule to-day in the native population and the surviving families not always by any means excessively numerous. Taking into account the later marriages of to-day and the lessened infantile death-rate, the difference may not be so serious a one as regards the maintenance of the race as at first sight appears. It is a misfortune when any country suffers in its birth-rate to such an extent as appears to be the case in France, and possibly in certain portions of this country and Canada. That these conditions are as general as has been recently claimed is not proved, and there is not enough reliable data to assume that they can be. Moreover, there are certain facts, those of emigration of the young, and the return of the old to their birth-places, for example, that may markedly affect the significance of the data we have. While it is advisable to be warned of possible evils, it is also well to be prepared to make due allowances for possible exaggerations and illegitimate deductions. The facts are yet wanting to justify the conclusion that there is any very pronounced decadent tendency as shown by a decreasing birth-rate in the native stock of this country except in certain limited regions, and even there there may exist conditions that are not fully allowed for by the alarmists.]

THE PHYSIOLOGY OF PREGNANCY.

The Determination of Sex.—[The problem of the determination of sex has always been one of great interest to the general public as well

as to the medical man and to the pure scientist. The interest is excited, however, more by the practical than by the scientific aspect of the subject; nevertheless, during the past 200 years, no fewer than 500 theories have been propounded with regard to the determination of sex, and the majority of these, if not the whole, are in all probability entirely without any foundation in fact. The practical interest raised by the problem leads an enthusiast to assert, every now and then, that he has at last discovered a method whereby the sex of the unborn child may be made to be what its parents desire. Many will doubt whether such a discovery, could it have been made, would not in the end have brought about disastrous results, and they will at least rejoice that the observations of recent years, and more especially those of Beard, Bessels, Boveri, Farmer, Guignari, O. Hertwig, Häcker, Moore, Meves, von Rath, Rückert, Strasburger, Weismann, and others, all tend to the conclusion that sex is predetermined before the embryo begins to exist, and, to quote Beard's words, "any interference with or alteration of the determination of sex is absolutely beyond the human power." During the search for the point at which sex is determined new facts have been brought to light and some old beliefs have been disproved, and, among others, destruction has fallen upon the almost universally accepted opinion that the organisms produce the germ-cells, and that by the union of germ-cells of different sexes a new organism is produced. The latter part of this belief is no doubt correct, but as regards the first part the fact seems to be that the organism is only a nidus in which the germ-cells rest before they proceed to the production of the elements of new germ-cells; an important nidus it may be, and all-necessary for the continuance of the germ-cells, but without any direct influence upon the characters or capabilities of the cells. This being the case, the practical interest ceases, but the scientific interest is undiminished, for the exact period at which sex is determined is as yet not discovered, though it is surmised. So far as the evidence at present available goes, it appears from the results of the researches of Beard and others that of the 32 cells produced by the first 5 divisions of the fertilized ovum, one becomes a primitive germ-cell and the others are utilized for the formation of the membranes and appendages by means of which the embryo about to be formed is nourished and protected. The primitive germ-cell divides simultaneously with the further divisions of the non-germinal cells, and in this way the number of the products of the primitive germ-cell, which are known as primary germ-cells, become 2, 4, 8, 16, 32, 64, 128, 256, etc. One of the primary germ-cells continues to divide and its descendants form the embryo. The remaining primary germ-cells become the germ-cells of the embryo. As a rule, they accumulate near the root of the mesentery in the germinal ridge, and ultimately they are inclosed in the ovary or testicle. The sex of the ovum is, therefore, fixed before the spermatozoon fertilizes it.] In this respect M. von Lenhossek¹ takes a very different position from that assumed by Van Lint, whose work was recently reviewed in the "British Medical Journal,"² who holds

¹ Das Problem der geschlechtsbestimmenden Ursachen, Jena, 1903.

² April 11, 1903, p. 857.

that the sex of the embryo is determined by the relative strength of the spermatozoon and the ovum, a female embryo being produced by the union of a strong spermatozoon with a weak ovum. In order to maintain von Lenhossek's position it must be proved that after impregnation the ovum, and later on the embryo, has a sex, although it shows apparently no signs of it. The young embryo is neither to be regarded as neuter nor as hermaphroditic, but it is to be looked upon as already male or female, while as yet it shows no indications of sex. As early as the fifth week it is believed by Nagel that the cells of the future testicle can be distinguished from those of the future ovary, and it is maintained that it is not improbable that still earlier signs of sex may exist, if only we were able to recognize them. This, of course, is for the human subject; in some of the lower animals—as in *Dinophilus apatris*, one of the worms—there are ova which are quite recognizably different, the female eggs being large, oval, and granular, the males being small, round, and clear. The ova in the human subject, and in many of the animals, do not indeed show any sexual dissimilarity, either in their histologic or in their chemical characters; but similarity in these details may be only apparent, not real. Nature is constantly teaching us that dissimilarity may exist when we cannot perceive it; she also occasionally astonishes us into recognizing similarity between apparently very dissimilar states. He is a bold histologist who will nowadays maintain that no difference exists between two masses of protoplasm simply because his microscope reveals to his eye no difference between them. Another problem arises if we admit that sex is determined in the ovum before impregnation—namely, how long before impregnation is it fixed? Nothing very definite can be asserted upon this matter; but it may be asked whether, having carried the determination of sex so far back, there is any need to stop at, say, the maturation of the ovum. Is it not likely that the female infant comes into this world with the ova in her ovaries already male and female? This is undoubtedly a very important question, for if we admit the latter supposition, all our hopes of modifying the sex of offspring vanish into thin air. If, on the other hand, the sex of ova is not settled till maturation, then there may be some chance of altering their destiny. So it will be seen that the practical side of the problem has been gradually narrowed down. No treatment of the mother after her pregnancy has begun can be efficacious, for the sex of the ovum is fixed before there is yet an embryo. It is possible that treatment just before pregnancy may be of some effect, but only if the sex of the ovum is determined at or about the time of maturation. But if we admit this possibility of a therapeutic determination of sex, what is the treatment to be? Von Lenhossek shows fallacies in the well-known methods of Schenk, of which so much has been heard in recent years, and it must be admitted that the reasoning upon which they are founded is not in accord with biologic discoveries. The tendency of recent research has been to show that the better nourished the ova are, the more likely will they prove to be female, while the poorly nourished ones will give origin to male embryos. This conclusion has

not, however, been established, and, even if it be proved for the human subject as well as for the lower animals, it does not follow that it can be put to practical use. How can we, so to say, starve the ova in a woman's ovaries before the beginning of pregnancy? To starve the woman may or may not be effectual, for it would seem that under such circumstances the reproductive function may, as it were, take precedence over the others; the ovary with its ova may become, from the standpoint of nutrition, the preferred part.

Many valuable statistical studies have been made to determine the influence of parental age upon the sex of the offspring. According to Sadler and Hofacker, if the husband be younger than the wife, there are as many boys as girls; if both are of the same age, there are 1029 boys to 1000 girls; if the husband be older, 1057 boys to 1000 girls. These laws are not to be accepted as conclusive. The normal proportion between female and male births is 100 to 105 or 106. In the case of illegitimate births the proportion is reversed, at least for the children first born. Kaltenback calls attention to the fact established by Hecker-Ahlfeld that there is a great excess of male births in old primiparas, this being 124 and 140 to 100. According to a contribution of Janke published in 1891, if a boy be desired the sexual sphere of the wife and her sexual appetite must be strengthened to the utmost by generous, even luxurious, diet while the husband lives more as a vegetarian. This reminds one of the suggestion of Debay, that in order that a boy shall be produced the wife must for 20 to 25 days before the impregnating coition live chiefly on nitrogenous foods.

The Origin of the Liquor Amnii.—An editorial in the "British Medical Journal"¹ remarks that the leading article on the origin of the liquor amnii, published shortly before² has been the occasion of eliciting from Henry Morris a letter³ recalling to the memory of the profession his researches on this interesting subject, which were carried out in 1876. [We are perhaps too prone in these days to go to foreign sources for our information on the scientific and experimental aspects of medicine, and to neglect researches carried out within our own realms.] Morris's case of congenital hydronephrosis⁴ was a very interesting one, and from it the author drew this conclusion, *inter alia*, that the liquor amnii is in part composed of fetal urine. There is no information whether the liquor amnii was diminished or increased in amount in this instance, and unfortunately in most of the reported cases of hydronephrosis no mention is made of this important fact. At the same time, Morris's conclusion does not depend for its proof upon the coexistence of oligohydramnion and hydronephrosis, for it is possible that before the development of the hydronephrotic condition urine may have passed in sufficient quantity into the cavity of the amnion to prevent any noticeable scarcity of the liquor amnii, or the hydronephrosis may have been intermitting. It is true that Ballantyne⁵ describes a case of bilateral

¹ February 7, 1903.

² Brit. Med. Jour., Jan. 24, 1903.

³ Brit. Med. Jour., Jan. 31, 1903.

⁴ Obst. Jour. of Great Britain, vol. iv, p. 267, 1876-77.

⁵ Manual of Antenatal Pathology, p. 381.

hydronephrosis with hypertrophic dilation of the bladder in a fetus in which the liquor amnii was estimated at not more than 1 fluidounce; but he also refers to an observation made by F. Fabris¹ in which the bladder had no communication with the exterior, and contained 2.5 liters of fluid, and yet there was marked hydramnios. A. R. Simpson,² also, some years ago, showed an anencephalic fetus with functionally useless kidneys, whose birth had been accompanied with a great flow of liquor amnii. It cannot, therefore, be maintained that the reported cases of fetal hydronephrosis have demonstrated the renal origin of the liquor amnii, but the occurrence of a considerable number of instances of this antenatal malady, in all of which there was scarcity of the amniotic fluid, would go far to prove the participation of the fetal kidneys in its production. Chemical analyses of the liquor amnii, and of the fetal urine, such as were made for Morris by William Foster,³ have shown the marked resemblance which exists between the composition of these two fluids; but it must be remembered that urea may be met in transudates, and does not of necessity indicate a renal origin. All such investigations, as well as the information derivable from the morbid fetuses referred to in a previous article,⁴ support the view that the liquor amnii is of fetal origin, but they do not absolutely prove it, neither do they certainly point to the fetal kidneys as the only or constant source of the fluid. The complexity of the problem of the metabolism of the unborn infant is very great.

Comparative Investigations of the Blood and Amniotic Fluid of the Mother and Fetus.—The physiologic processes which take place between mother and child during pregnancy are still in a large part unexplained. Some of these problems are considered in a series of investigations lately made by W. Zangemeister and T. Meissl,⁵ and include the determination of the red blood-cells in both mother and child, the lowering of the freezing-point of both serums and the amniotic fluid, and finally the specific gravity, the chlorin-content, and the total quantity of albumin. The following facts were determined: The number of red cells is relatively greater in the child than in the mother; the blood of the child does not coagulate so readily as that of the mother, nor as completely, so that it was often difficult after 24 hours to obtain enough serum for the tests; the serum of the mother contained, as a general thing, a larger amount of albumin than that of the child, but the specific gravity and the total oxygen-content of the serum of the mother was always greater than that of the child; the quantity of chlorids is about the same in both individuals; the average freezing-point of both serums is approximately the same, which means that the blood of infant and mother is under the same conditions of osmotic pressure. As regards the liquor amnii, it was found that the specific gravity and amount of albumin varied, under normal conditions, within very small limits. The

¹ *Annali di Ostet.*, xvii, p. 329, 1895.

² *Trans. Edin. Obstet. Soc.*, vii, p. 122, 1882.

³ *Morris's Surgical Diseases of the Kidneys*, p. 334, 1885.

⁴ *Brit. Med. Jour.*, Jan. 24, 1903.

⁵ *Münch. med. Woch.*, April 21, 1903.

quantities seemed to be less in the amniotic fluid than in the blood. The lowering of the freezing-point is always less in the liquor amnii than in the blood, and this is probably one of the most marked differences between the two. Halban and Landsteiner¹ have made a series of experiments upon the serum of maternal and fetal blood in the Anatomical Institute at Vienna. Their conclusions are as follows: There is a marked difference in the reaction of maternal and fetal blood in several respects. The serum of the mother's blood requires a larger number of corpuscles to undergo solution than does that of the fetus. The serum of the mother's blood agglutinates blood-corpuscles much more actively than does that of the fetus. It has also a stronger action against bacteria and against the process of fermentation. It is also more potent as an antitoxin, and is a more potent agent as an immunizing serum. The active principles of blood-serum seem to be present in the blood of the fetus, but not to be well developed nor to be active. The deficient development of blood-serum in the newborn explains the susceptibility of infants to infection. [It would be of interest and practical importance to ascertain at what period of extrauterine life infantile serum becomes active, and how such a result could be brought about.]

The Isolation of the Living Uterus.—E. M. Kourdinsky² has attempted to study the physiologic processes of the uterus by isolating this organ and keeping it alive for a sufficient length of time to make the needed observations. The first attempt of this kind was made by Rein, who used defibrinated blood for the process of keeping the uterus alive. The author used the more modern methods of physiology and employed Locke's fluid³ for this purpose. He performed laparotomies on female rabbits under chloroform. A cannula was then introduced into the abdominal aorta and its lower end was injected with Locke's fluid, thus flushing the vessels of the uterus. The fluid returned through the veins, and when the womb had been well washed, it was excised under great precautions, with its appendages, the broad ligaments and the vessels belonging to it, and then the whole preparation was placed in a special apparatus in which the fluid was kept circulating through the uterine arteries and veins. The apparatus consisted of a metallic box lined with cotton and provided with double walls, between which warm water circulated. The fluid to be injected into the organ was kept warm by passing it through a coiled tube in warm water. The work of the uterus was recorded by means of a catheter supplied with a rubber bulb which transmitted the contractions pneumatically to a recording tambor. The results of this study are as follows: A varying length of time is required to revive the isolated rabbit's uterus—usually about an hour. The reflex excitability of various uteruses differs considerably, but as a rule pregnant uteruses are more excitable than nonpregnant ones. Young non-pregnant uteruses, however, often work very vigorously. The uterus was also observed in this manner during labor, and it was found that the contractions of the cornua and those of the uterine os did not depend

¹ Am. Jour. Med. Sci., May, 1903.

² Roussky Vrach, Dec. 21, 1902.

³ Centralbl. f. Physiologie, 1900, vol. iv.

upon each other, and did not occur simultaneously. The waves of contractions recur at more or less regular intervals after each other. After about an hour the uterus begins to get tired, the waves are more distant from each other, become longer and less regular, and finally the curve becomes a straight line. After a period of rest the uterus begins to work again with the same regularity, and again there comes a period of rest. In a word, the rhythmic arrangement of the work of the uterus in labor is well regulated. The contractions of the cornua are peristaltic in character, resembling very much those of peristalsis in the intestines, and the movements of the rain-worm. They usually start at the abdominal end of the cornua. The contractions of the os and vagina are more like constrictions, which disappear after having been drawn for a few seconds. The influence of oxygenation on the work of the uterus was also shown. If the oxygen supply is gradually withdrawn, the contractions soon weaken and stop; if the oxygen supply is suddenly withdrawn at the acme of a series of waves, the uterus continues to work for a time as though nothing had happened, but soon loses its tone and stops contracting. The author also observed the act of birth itself, and believes that he was the first to see the actual process of expulsion from an isolated uterus.

The Relation of Meconium to the Fetal Appendix.—A. Low,¹ in the course of a systematic examination of fetal abdominal viscera, has observed that the disposition of the meconium with regard to the different portions of the fetal intestinal canal is as follows: (1) *Small intestine*: Meconium begins to distend the lower half about the middle of the fourth month, and continues to do so to a variable extent until the end of fetal life. (2) *Large intestine*: Meconium begins to distend the rectum about the beginning of the fifth month, thereafter tending to accumulate in the cecum, and then gradually distending the whole of the large intestine, so that after the seventh month dark green meconium distends the large intestine in its whole length. (3) *Appendix vermiformis*: Meconium was noted to be present in the appendix as early as the middle of the fourth month, and thereafter in nearly every case it was present in the appendix until the end of fetal life. The amount of meconium in the appendix varies; it seems to depend somewhat on the condition of the cecum—if the cecum is distended, then the appendix is always distended, but there may be meconium in the appendix while the cecum is practically empty.

THE DIAGNOSIS OF PREGNANCY.

The Rectal Approach in Obstetrics.—W. G. Briggs² describes 4 cases in which dilation of the cervix was accomplished by digital manipulations through the rectum. In this and a former communication attention is called to the value of this procedure, as it avoids any possibility of infecting the genital tract, and by it a more exact and earlier diagnosis can be made. In delayed rotation the right index-finger in the rectum

¹ Lancet, May 2, 1903

² Amer. Med., Oct. 4, 1902.

can often crowd the sinciput backward or draw the occiput forward, while the left hand crowds the shoulder, or possibly the face, toward the median line. This is a procedure which markedly facilitates rotation. The case of a primipara is described in which the cervix dilated normally, but the second stage was slow on account of delayed rotation. Pressure by the right index-finger through the rectum against the right temporal region, with traction toward the median line on the shoulder, continued intermittently during and between several pains, rotated the head, and labor was terminated normally. This manipulation must be continued for some time, and perhaps be repeated, before the head will retain its new position. In rotating, the head drags with it the uterine tissues, and their elasticity tends to return the head to its former position. When the labor is delayed by imperfect flexion or delayed extension, the position may be altered by combined rectal and abdominal manipulations. In delayed or imperfect flexion, place the index-finger as far back on the occiput as possible and crowd the head forward (in relation to the fetus) while the other hand on the buttocks forces the body of the fetus downward, thus approximating the chin to the breast. This pressure should be applied and continued during the pain, and is generally repeated. In delayed extension traction should be made well forward on the sinciput, either with the finger in the rectum or with the palm of the hand applied to the perineum. In the application of forceps, the index-finger in the rectum is often of great assistance in guiding the blades and in adjusting them to the parietal surface of the fetal head.

THE HYGIENE OF PREGNANCY.

[Perhaps in no other single instance is the value of prophylaxis so marked, in the face of continuing conditions, as in the toxemia of pregnancy. Under evidences of infection a woman may, by a watchful course of attention, be carried along, oftentimes, to full term and delivered of a normal child. But constant prophylactic measures, consisting of the very free ingestion of pure water, the use of frequent hot baths and the hot pack, milk-diet, and the frequent administration of cathartics, are required. These measures may so modify and hold back the effects of toxic material generated within the body as a result of the pregnancy as to enable a safe continuance thereof, but at no time should vigilance be relaxed. If in spite of these preventing means signs of peril still are observed, the recourse to premature delivery is always at hand, the attending physician protecting himself—and his patient as well—by due counsel.] F. W. Smith¹ urges that the hygiene of pregnancy must begin in the childhood of the woman. As soon as pregnancy begins the woman should consult her physician for thorough general physical examination.

¹ Med. Rec., July 19, 1902.

PATHOLOGY OF THE FETUS AND OF THE FETAL APPENDAGES.

Deciduoma Malignum.—[Deciduoma is undoubtedly a disease which is growing more frequent, or is more frequently diagnosed. It is astonishing that so grave a malady was overlooked until Professor Säger turned attention to it in 1888. The development of a deadly complication a short time after delivery might naturally cause the patient to attach some blame to the obstetrician.] James F. Baldwin,¹ at a recent meeting of the American Association of Obstetricians and Gynecologists, related the case of a woman who was normally delivered; the placenta was supposed to have been expelled entire. Two weeks later another physician was sent for, and he found a piece of after-birth which he removed, making use of the curet. "Criticism was indulged in, and a suit for malpraxis was in the air," said Baldwin. Two or three weeks later the second physician examined the patient and found what appeared to be more after-birth. Baldwin carefully explored the uterus, and discovered all the signs of malignant disease. The uterus was removed through the vagina, which was free from deposit; on pulling down the omentum a large secondary nodule was detected and removed. A few weeks after convalescence cachexia set in, followed by death. Baldwin believes that he has met quite half a dozen genuine cases of deciduoma in his practice, while McMurtry related in full before the Association the history of a patient in whom the malignant change came on within a month after delivery. [All good teachers warn the student and the midwife of the immediate dangers of sepsis if the placenta and membranes are not removed entire. The frequency of malignant deciduoma teaches that placental relics may be sources of yet more deadly complication. On account of the rapid growth and early metastases of deciduoma malignum the mortality is necessarily high. In 124 recently reported cases, the mortality has been 59 %. This is to be contrasted with 52 cases occurring previous to 1897, as reported by Dorland, in which the mortality was 73 %, the better showing in the later series being due to early recognition and prompt operation.] J. H. Teacher² concludes that: (1) The so-called deciduoma malignum is a tumor arising in connection with a pregnancy, and originating from the chorionic epithelium (or its forerunner, the trophoblast), which is of fetal epiblastic origin (the view of Marchand). (2) That these tumors form a quite characteristic group clinically, pathologically, and developmentally, and that they should be classified neither as sarcomas nor as carcinomas, but as a distinct group *sui generis*. The most appropriate name is **chorion-epithelioma**. Malignant hydatidiform mole may be treated as a variety of this disease. (3) That in addition to the common tumors developing from a pregnancy there are tumors containing precisely similar structures which are not connected with a pregnancy, and may occur in other parts of the body than the uterus, and in either sex. The

¹ Am. Jour. Obstet., No. 5, 1902, p. 716.

² Brit. Med. Jour., June 20, 1903.

most probable explanation of them is that they are teratomas, originating from some structure which has the morphologic value of an included ovum, and the chorion-epitheliomatous tissues represent the actual trophoblast (chorionic epithelium) of the included ovum. The following conclusions as to the nature of the growth are offered by D. Krewer.¹ This epithelioma of the chorion belongs directly to the malignant type of tumors, and is composed of the overgrowth of epithelium from the chorionic tufts. It is composed of two varieties of cells which are physiologically connected with these villi and gather in the tumor around the walls of bloodvessels, which appears to be an explanation for the enormous bleeding which is present in this disease. The relation of the two varieties of cells in the tumor is analogous to that which is found in the normal chorionic villi. Metastases appear to occur by way of the blood-current. Oncologically, the tumor belongs to the class of carcinoma. Busse² reports a very unusual case of a woman who died 6 months after an abortion, multiple emboli being detected in the pia mater, brain, lungs, kidneys, and spleen, traceable to a large parietal thrombus in the left ventricle, itself clearly secondary. The thrombus, as well as the emboli, exhibited the characters of deciduoma malignum. When the uterus was examined no trace of deciduoma could be found. Busse believes that some chorionic villi were detached and got into the circulation during the abortion. Hübl³ publishes full notes of a somewhat important case of a form of deciduoma malignum. His patient, under treatment in February last, was then 36 years old. She had been through 3 complete pregnancies followed by an abortion at the third month, then another pregnancy to term, August, 1899. In June, 1900, a vesicular mole was removed by operation. In December, 1901, she was delivered of a macerated child over 4½ pounds in weight; 7 weeks later hemorrhage set in, and at the end of 3 weeks was so severe that the parts were examined. The patient was anemic and distinctly cachectic. A tumor as big as a walnut was detected in the vagina posteriorly and inferiorly, the mucous membrane was perforated and bled, and there was also a bleeding ulcerated point on the tumor. The uterine mucosa and the rest of the uterus and appendages were normal. The vaginal tumor was freely excised and sutures applied to the seat of excision. The tumor was made up of syncytium and cells of Langerhans's layer in the midst of a hematoma. Ten days after the operation the wound had healed well, but bleeding soon set in, and on the twentieth day several deposits had appeared; they were spreading all over the vagina. At this stage Hübl's report was published. The case agrees with another described by Peters, in which a primary deciduoma of the vagina proved as malignant as is a uterine growth of the same kind. Schauta has implied that vaginal deciduoma is not essentially malignant. Hübl remarks that Schauta's opinion was based on 3 cases recorded by Schmit and Schlangenhäuser, but in all operation was very early; and in one which Hübl examined there was a hematoma entirely surrounding

¹ Zeit. f. Geb. u. Gyn., 1902, Bd. xlviii, Heft 1.

² Monats. f. Geb. u. Gyn., Nov., 1902.

³ Cent. f. Gynäk., No. 48, 1902.

the newgrowth, while in his own case the newgrowth had spread beyond the hematoma. F. J. McCann¹ reports a case of deciduoma malignum occurring after the menopause. The patient was 53 years of age and had borne 10 children. Menstruation ceased 18 months before her admission into the hospital on March 21, 1902, and during 12 months there was no loss of blood. In October, 1901, a sudden gush of blood came from the vagina, and the flow continued for one day. The hemorrhage recurred every 4 or 5 days until 3 weeks before admission, its severity being such that the patient was confined to bed during the flow. On examination the uterus was found enlarged to about the size of a 3-months pregnancy, was uniform and soft in consistence, and freely movable. On passing a sound into the uterus under chloroform, blood literally poured out, and a gauze plug was employed to check the hemorrhage. Two days later vaginal hysterectomy was performed, and though the patient rallied from the operation her subsequent course was unsatisfactory, and death occurred on the sixth day from suppression of urine. On cutting into the uterus the whole cavity was found to be filled with clot, some recent and some of old standing, while the uterine wall was intensely vascular; there was no evidence of newgrowth in the clot. Sections cut at different levels demonstrated the existence of newgrowth between the clot and the uterine wall, and some cells penetrated the wall. The growth was composed of multinucleated masses of protoplasm, and of a loosely reticulated tissue containing in its meshwork rounded cells with deeply staining nuclei. The remainder of the section was composed of fibrin and blood-clot. The Pathologic Committee of the Obstetrical Society of London reported that the specimen was undoubtedly an example of deciduoma malignum.

The Transmission of Chorionic Villi.—[These have frequently been observed in metastatic deposits following a cystic mole or carcinoma at the placental site in pregnant women. A satisfactory explanation of their occurrence in such cases has heretofore never been presented, and in investigating this subject the question would naturally arise whether analogous conditions may not be found in other pregnant states.] W. Poten² has recently published the results of his investigations in this field. He has carefully studied a series of sections of gravid uteruses, 7 in number and varying in period from 2 to 9 months. His observations are worthy of note. In all cases, even with a normal placental attachment, it was possible to demonstrate the presence of detached chorionic villi in the maternal bloodvessels in numbers varying greatly in different cases. No evidences were found which would warrant the belief that in normal cases these migrating villi had any effect on the fluid character of the blood. No changes in the vessel-walls in the neighborhood of the particle and no clotting could be detected. True emboli, however, could be formed after passing the heart, in the pulmonary arterioles and capillaries, as the greater number are undoubtedly carried to this locality. During the act of coughing or during a bearing-down pain the venous

¹ Jour. of Obstet. and Gyn., March, 1903.

² Arch. f. Gynäk., vol. lxvi, No. 3, 1902.

stream may be halted or momentarily reversed, and at this time a few particles may get into the peripheral veins, which would account for their occasional presence in vaginal nodules. The etiologic factors which induce these conditions remain as yet a matter of doubt. The villi in certain cases may be more brittle or the placental attachment insecure, but the author inclines to the theory that changes in the blood-pressure constitute the principal cause. This is manifested by stasis and eddies in the blood of the maternal sinuses by which the floating villi may be torn away. Eclamptic conditions would appear as most likely factors in causing this phenomenon, but in two specimens derived from such cases only a moderate number of migrating villi were found. Strange to say, the largest number were seen in sections of a uterus from a patient who had died from hemorrhage resulting from placenta prævia, that is to say, with a diminished blood-pressure. These contradictory results do not permit at present a definite knowledge of the true etiology of this condition. It appears, however, that the transmission of these separated masses of villi in the maternal blood-stream is liable to occur in the course of any pregnancy, but must not be considered of physiologic or even of pathologic significance. The disintegration in the blood-stream without any resulting symptoms is probably the ultimate fate of these minute tissue particles. The author believes, however, that syphilitic infection of either mother or child may be induced by this means. The villi have been observed to contain fetal blood, which would naturally be set free in the maternal circulation when the former are disintegrated. If the fetus is syphilitic, the virus could thus be readily transmitted. In the same way the blood of the mother who has become syphilitic during her pregnancy could infect the fetus by contact at the points where the villi have been torn away. The observations also explain how in cases of malignant degeneration of the chorion, such as cystic moles and syncytial cancer, these migrating villi may cause metastatic deposits in other parts of the maternal organism.

Hydatidiform Mole.—Findley¹ reports 2 cases and summarizes his study of the subject as follows: The causation of hydatidiform mole is unknown. It is most frequently found between the ages of 20 and 30 years; more often in multiparas. It probably results from degeneration of the villi of the chorion through some disturbance of the maternal circulation. The connective-tissue stroma of the villi degenerate, with serous infiltration or edema. The syncytium and Langerhans's cells penetrate more deeply when the maternal nutrition is defective. In 16 % of the cases malignant degeneration occurs. It is very difficult to draw the line between benign and malignant cases. The examination of a specimen gives but little information regarding it. Retention of a mole within the uterus does not influence its disposition to become malignant. Diagnosis can only be positively made from seeing the vesicles. The most constant clinical point lies in the rapid development of the uterus, with irregular shape and consistency and hemorrhage. The treatment of the condition consists in emptying the uterus at once. Because the

¹ Med. News, Dec. 6, 1902.

womb is thin and weak it is best to avoid the use of the curet and to employ ergot and vaginal packs to control the hemorrhage and stimulate expulsion. After the mole is expelled, the uterus should be explored with the finger, irrigated, and packed with iodoform gauze. Two weeks after the birth of the mole the uterus should be curetted, the scrapings examined, and if malignant disease is beginning, hysterectomy should be performed. The patient should be kept under observation for 3 years afterward, and should hemorrhage occur the uterus should be again curetted and the scrapings examined microscopically. Statistics show the average age of these patients to be 27 years, the extremes being 13 and 58 years. In one patient 11 moles developed. In 8 cases there was cystic degeneration of the ovaries. In 1 case the mole developed in the fallopian tube. The longest period at which malignant disease occurred after the development of the mole was $4\frac{1}{2}$ years. The mortality of this condition is 25 %. The causes of death are: syncytioma malignum, 16 %; hemorrhage, 4 %; septic peritonitis, 2 %; other causes making up the remainder. According to D. Berry Hart,¹ it has long since been known that deciduoma malignum follows hydatid mole in about 50 % of all cases. What is the nature of hydatid mole? Is there a malignant and a simple form of the mole? Can we tell histologically what form will develop malignant disease? The questions must be considered from the following standpoints: (1) The structure of the early normal villus; (2) the naked eye and microscopic structure of the hydatid mole; (3) the clinical features of hydatid mole; (4) its relation to deciduoma malignum; (5) the possible nature of hydatid mole and its relation to deciduoma malignum; (6) can we ascertain by microscopic examination of the mole, or of its curettage-fragments after abortion, whether deciduoma will develop ultimately? Normally the early villus has a double epithelial covering—Langerhans's layer and the syncytium. These can absorb decidual tissue penetrating into it, and can pass into bloodvessels without coagulating the blood; while normally their progress is always marked by the condensed layer (Nitabuch's fibrin-layer). Finally, both epithelial mantel and connective-tissue core, which approximate the Whartonian jelly in structure, differentiate in the normal placenta, the syncytium gradually thinning, the cells of Langerhans becoming more flattened, while the connective tissue loses its myxomatous state and becomes more fibrous. With hydatid mole there is no fetus present. The membranes alone may be degenerated, the placenta healthy. When we have a fetus, a placenta, and a hydatid mole together, the case has been probably a twin where one of the ova has been fertilized and the other become a mole. The absence of a fetus is a great fact, not hitherto appreciated. Hydatid mole is rare, estimates varying from 14 in 10,200 cases to 1 in 728 (König, quoted by Gebhard) and 1 in 2400 (St. Bartholomew's statistics, quoted by Williamson). Hydatid mole has been found in the tube, and also in the paravaginal tissue; the latter is a metastasis, but such rare conditions are only diagnosable by operation. Deciduoma in about half the reported cases is

¹ Brit. Jour. of Obstet. and Gyn., Nov., 1902.

preceded by hydatid mole. Virchow termed the mole "myxoma chorii." The author believes that the term deciduoma should be changed to metastatic mole. The proportion of cases of deciduoma malignum following a mole is very low, hence it would be wrong to extirpate the uterus in every case of mole. There is nothing in the microscopic examination of a mole to determine that it will become a case of deciduoma malignum.

Hydrorrhœa Gravidarum.—[A sudden discharge of watery fluid from the vagina during pregnancy naturally suggests the commencement of labor, and it is of practical importance in a given case to determine the source of the flow.] W. Sinclair Bowen¹ points out that the fluid may not have come from the amniotic sac, but from some portion of the decidua, due to the fact that there is an existing "deciduitis." Deciduitis is a characteristic endometritis modified by the changes in the uterine mucosa peculiar to pregnancy. The disease may be acute or chronic. The acute form may be divided into: (1) the infectious or exanthematous, (2) the hemorrhagic, and (3) the purulent. Chronic deciduitis is a much more common complication of pregnancy and is a predisposing cause in a majority of earlier abortions. There are 4 varieties of the chronic form, differing in clinical history, severity, and in the constituent element of tissue involved: (1) the diffuse hyperplastic; (2) the polypoid; (3) the cystic; and (4) the chronic catarrhal. There is an uncertainty as to the exact etiology and pathology of hydrorrhœa gravidarum. The exact source of the fluid is as uncertain as its pathology, and it is more than likely that all the constituent elements of the decidua contribute to the formation of the fluid. The discharge may take place suddenly without any warning, or there may be some discomfort due to uterine contraction. The fluid is clear, thin, pale yellow, and contains albumin. The flow occurs several or more times. The os is closed. In rupture of the amniotic sac the occurrence is usually at the end of the pregnancy and immediately precedes delivery. Labor-pains have usually been going on for some time. The discharge is but once. The liquor amnii contains but a trace of albumin, and an abundance of urea.

The Recognition of Fetal Syphilis.—Hecker² has made a thorough examination of 62 stillborn children, and has found 33 (53 %) syphilitic and 6 (9.7 %) doubtful. Many of the cases (15 out of 33) could not be definitely considered syphilitic immediately at autopsy, but had to be examined histologically before the diagnosis could be made certain. A macroscopic diagnosis was made only when at least two organs showed undoubted signs of syphilis. The spleen was the organ oftenest affected; then the bones, liver, kidney, etc. For histologic examination the kidneys are the most suitable organs, as they are the last to show signs of maceration, and are found more frequently diseased microscopically than any other organ. They were found involved in 90 % of cases: spleen, 61 %; thymus, 50 %; pancreas, 46 %; bones, 43 %; liver, 23 %; lung, 17 %; navel, 16 %. The so-called macroscopic syphilitic bone-

¹ Am. Jour. of Obstet. and Dis. of Women and Children, Oct., 1902.

² Deut. med. Woch., Nov. 6 and 13, 1902.

lesions were often found microscopically to be only irregularities due to maceration. Hecker discusses at length the macroscopic and the microscopic syphilitic lesions, dividing the former into pathognomonic, probable, and uncertain signs, and considering the latter from the standpoint of the bloodvessels, the connective tissue, the epithelium, and the disturbances of development. He concludes his valuable article with the dictum: If the autopsy of a mature or immature fetus leave the presence or absence of syphilis in doubt, a microscopic examination should be resorted to. If frozen sections cannot be stained, small pieces of kidney, spleen, thymus, pancreas, lung, and liver should be hardened. The kidneys should be examined first, and in case of negative results, the other organs in the order named. The round-cell infiltration about the renal bloodvessels will usually make the latter superfluous. Congenital syphilis may with certainty be said to be absent only when microscopic examination of all the organs mentioned has shown that none of the pathologic lesions of syphilis was present.

Rigor Mortis in the Fetus.—Ludwig Seitz¹ gives an exhaustive critique of this subject, supporting his conclusions with abundant evidence. In the adult rigor mortis bears the closest relation to normal muscle-activity. The results of the latter are the production of lactic and carbonic acids. Probably the only difference between the two conditions lies in the nonremoval, in the dead body, of the acids from the muscles. At any rate, their accumulation is the cause of rigor mortis by the production of coagulation of the myosin. This involves shortening, and the stiffness is due to simultaneous contraction of opposed groups. Rigor mortis is hastened by previous muscular exertion, and it can be produced by the injection of acids and chloroform. It has two stages, a preliminary waxy rigidity, and the well-established stiffness. Turning to fetal life, the best-known text-books of the day, physiologic and medicolegal, state that rigor mortis does not occur before the seventh month, which is, beyond question, erroneous. Seitz gives 11 cases observed by him of fetuses in more or less general rigor mortis, the length ranging from 18 to 36 cm., the weights from 130 to 1800 grams; the temperatures from 1° to 8° C.; and the time of examination (when known) from 7 to 48 hours after death. The rigidity was true rigor mortis and not a desiccation effect, as it occurred equally when the fetuses were wrapped in wet cloths, and was present in one fetus still in the amnion. As regards fetal rigor mortis *in utero* (or at the moment of delivery), since 1894, 20 cases have been reported by 3 observers. The author adds 4 of his own, making 24 in all. But why do we know only these few cases? The chief reason is that rigor mortis is passed through, to the subsequent relaxation, *in utero*. It could occur there, inasmuch as, though the subsequent relaxation is generally regarded as a decomposition effect, L. Herrmann has shown that it can occur when decomposition is excluded, the continued action of the acids present leading to the formation of acid albumin. That it actually is passed through there, is, moreover, indicated by those cases in which the recently dead fetus (in

¹ Sammlung. klin. Vorträge, No. 343, 1902.

which no maceration is visible) is born relaxed, and is incapable of passing into rigor mortis. Of this the author gives a case in which during 48 hours no rigor mortis set in, and the injections of acids and chloroform failed to bring it about. Further, when the child dies during birth, the length of time after death is, in an average parturition, not sufficient for rigor mortis to develop, and after extracting a dead child, the accoucheur, having much else to engross his mind, usually gives no further attention to it. Besides rigor mortis, especially in the first stage, can be broken up by the movements impressed upon the child during parturition, especially if manipulative assistance is given. And actual cases are cited in which unusual difficulties in operative procedures have been reported as due to abnormal stiffness of the fetus; in which at birth rigor mortis was present everywhere except just in the parts manipulated, and in which no one of a number of physicians had noticed anything peculiar in a child in which, when extracted, the arms were stiff, and 5 minutes later rigor mortis was thoroughly established. The second case shows that, as might be expected, in its second stage, also, rigor mortis in the fetus can be broken up during parturition.

Fetal Monstrosities.—According to Thompson,¹ there are 3 types of congenital malformation of hollow viscera in which the main anatomic abnormality that is present consists in very great muscular hypertrophy, for which no permanent organic cause is discoverable. These are hypertrophy of the bladder with dilation of the ureters, of the colon with no organic stricture, and of the pylorus and stomach-wall. In all these the chief abnormality is enormous hypertrophy of a muscular coat of a hollow organ known to be active *in utero*; and the amount found in some cases soon after birth shows that it must have been present during intrauterine life, and in none is there any evidence of such permanent organic obstruction as would give rise to overgrowth of muscle. There are two chief hypotheses as to the cause of this hypertrophy: (1) That it is a primary developmental hyperplasia; and (2) that it results from overexertion. Thompson accepts the second theory as the true one, and since there is no obstruction to cause overexertion, he endeavors to show that it is the result of lack of coordination in the action of the organ during intrauterine life, and suggests that this lack of coordination may be a kind of intrauterine developmental neurosis.

Antenatal pathology presents no monster which, while preserving some semblance to human form, deviates therefrom in stranger and more striking manner than the condition known as **elephantiasis congenita cystica**, remarks J. B. Hellier.² The malformation depends upon 3 conditions: (1) Certain defects of the skeleton. These, however, are not the essential thing. It is not as in spina bifida, in which the osseous defect causes the meningocele. The distorted contours depend upon disease of the soft parts; (2) the general anasarca of the body; (3) the characteristic lesions consist of the formation of extensive, irregular cystic cavities in the subcutaneous tissue. After reporting in detail 2 such cases, the author summarizes as follows: The first monster may

¹ Brit. Med. Jour., Sept. 6, 1902.

² Brit. Jour. of Obstet., Feb., 1903.

be described as an *acardiac fetus*—a parasitic twin. It was affected with hydrocephalus and cystic elephantiasis and general dropsy. It had developmental defects in the anterior thoracic wall and in the extremities, with great defects in the internal organs, the heart, lung, liver, and spleen being absent; the kidneys were rudimentary and the alimentary canal was imperfectly developed. The second had also cystic elephantiasis, absent upper extremities, and a rudimentary development of the face and skull.

Complete **ectromelus** is a somewhat rare condition; partial ectromelus affecting one extremity is much more common. John McGibbon¹ reports a case of a female child in whom both the upper and lower extremities were absent (Fig. 59). The stumps of the lower extremities ended in fleshy nodules, and those of the upper extremities were rounded, as after an ordinary amputation. Bones could be felt in all the 4 stumps.



Fig. 59.—McGibbon's case of ectromelus (Lancet, Sept. 20, 1902).

The child was the fourth of the family. There was no history of shock or maternal impression, and no trace of any deformity in the other children of the family or their relatives. During the last stages of pregnancy the mother suffered much from pain in the abdomen. False labor came on, and persisted for 48 hours before the os relaxed. On account of this, he was called to see the case by the midwife in charge. The child was otherwise healthy and vigorous. On the nose was a large red birth-mark.

In all cases of **double monstrosity** there is, to begin with, one ovum, the varieties in form and

degree being determined by the extent and situation of the fission of the embryonal anlage, says Kedarnath Das.² When the splitting is complete and the two portions of the embryo go on to perfect development, there are born the so-called homologous or uniovular twins. Up to the twelfth day the two develop evenly. At that time the allantois buds out from the hind-gut of each individual, and its vessels reach the placental portion of the chorion. According to the degree of the development of the allantois and the placenta of the second embryo, one gets several varieties in *acardiac* fetuses: (1) *A. anceps*, characterized by nondevelopment of the face and anterior part of the body. This species is rare. (2) *A. acephalus*, which is the most common species; head wanting or rudimentary. Intestines and abdominal organs rudimentary and merest trace of the organs above the diaphragm. (3) *A. amorphus*. Least developed. Little more than

¹ Lancet, Sept. 20, 1902.

² Brit. Jour. Obstet. and Gyn., Oct., 1902.

a lump of connective tissue covered with an edematous skin. (4) *A. acarnus*. This is the rarest. The head alone is present, but is never fully developed. The author has collected 45 cases from the literature. *Acardiacs* are said to be rarely born in first labors (Geoffroy St. Hilaire), but 5 of these 45 occurred in primiparas. In 6 cases gestation went on to full term. The perfect twin is said to be born first. The sexes of the twins are said to be identical. *Hydramnion* is usually present. [The theory that these monstrosities are due to maternal impressions is untenable. Almost all varieties of monstrosities have been produced experimentally upon the eggs of birds and upon lower animals by the action of physical forces external to the embryo. Amniotic bands or adhesions frequently arrest development, causing anomalies. A. Keith suggests that inquiry into the condition of the mother during the weeks following conception might throw some light upon the cause.]

Marcel Baudouin¹ reports having found in the Museum of Pathologic Anatomy of the Faculty of Medicine of Paris a specimen of **teratopagus** which constitutes a new genus. It is essentially characterized by the peculiarity that the union, instead of taking place between the umbilicus and xiphoid,—in other words, at the level of the epigastrium,—extends from the umbilicus to the prepubic region, or to that corresponding to the hypogastrium; wherefore he proposes for this monster the name of *hypogastropagus*. This type of *teratopagus* is viable. An *hypogastropagus* is evidently intermediary between a *xiphopagus* and an *ischiopagus*, which is a new proof of the fact that in the teratology of double monsters it is possible to find all transitions between the most widely separated types.

THE PATHOLOGY OF PREGNANCY.

Hyperemesis Gravidarum.—[Since the introduction of anesthesia and antiseptics there has been no more valuable addition to practical therapeutics than normal saline solution. The surgeon, physician, and obstetrician alike appreciate the great value of this agent, and many lives have been saved by its timely employment either by hypodermoclysis, venous transfusion, or large rectal injections. For the relief of the shock due to hemorrhage, either during operation or postpartum, and for the dilution of toxic material in the system, whether associated with sepsis or eclampsia, salt solution is unexcelled, and transfusion, in which the blood from another person is introduced into the venous circulation, has been practically superseded by this more satisfactory and scientific method. Columns might be written upon the particular value of this therapeutic agent to the obstetrician alone.] It is interesting to note that Condamin² has secured splendid results in the treatment of persistent vomiting of pregnancy by the systematic injection, preferentially by the rectum, of from 3 to 4 liters of artificial serum or saline solution, daily, in divided doses of 300 grams each. The injection is made so slowly as to occupy from 10 to 15 minutes, and is arrested if it induces

¹ La Sem. Méd., Nov. 19, 1902.

² Lyon Méd., vol. xeviii, No. 5, 1902.

peristalsis, to be recommenced when the movements have ceased. Should there be intolerance, a few drops of laudanum may be added, or if necessary the serum may be introduced hypodermatically. During the first 10 days or so that the treatment is continued the patient takes neither liquids nor solids by the mouth, and then while the injections are continued for several days, oral nourishment is gradually increased from a few mouthfuls to the ordinary quantity. This treatment is based on the idea that the persistent vomiting of pregnancy is due to general intoxication, and it averted the necessity of inducing abortion in any of the 8 cases in which Condamin adopted it. According to Weil,¹ vomiting in pregnancy can be controlled with 10 drops of a 20 % solution of menthol, administered on sugar whenever the nausea appears.

Valvular Cardiac Disease in Pregnancy.—[The question of the effects of pregnancy in the case of a woman with valvular heart-disease is one that not infrequently confronts the physician. The family physician may be consulted early in a gestation, or not until marked symptoms arise, or he may be called upon to advise as to the marriage of a woman with cardiac disease. In either event the prospects must be carefully weighed and the patient should be made to feel the dangers surrounding her. Much will, of course, depend upon the location and degree of the cardiopathy, and the existing compensatory circumstances and the compensatory possibilities, and the occupation of the patient, together with her general health and habits, having in mind that the common danger in such cases rests with the increased amount of work thrown upon the heart from the large volume of circulating blood. And then it must be remembered that this danger becomes greater with the progressing pregnancy. As a general conclusion it may be stated that a woman with heart-disease, especially a valvular lesion, has a shorter life-expectancy if she becomes pregnant, and that her danger sharply increases with succeeding gestations.] An analysis of 6 cases of pregnancy occurring in patients with heart-disease is presented by G. Morelli.² Of the number, there were 1 death occurring 2 months after parturition, 1 abortion, 2 premature births, and 2 which went to full term and passed safely through the puerperium. All suffered serious disturbances, and the condition of all, with one exception, was aggravated during the puerperal period. From all of which the author concludes that cardiopathies unfavorably influence the course of pregnancy and frequently lead to its spontaneous interruption; which latter may be looked upon as the maternal organism's natural measure of defense. Pregnancy, parturition, and the puerperium in many instances aggravate cardiac disease and bring about a disturbance of compensation which may prove fatal. No one line of treatment can be applied in all cases; hygienic, medical, or obstetric treatment being required in individual cases. Jardine³ calls attention to the low death-rate in these cases—1 to 13. He calls attention to pure mitral stenosis as being the most deadly form of heart-disease complicating labor. When labor ends in

¹ Clin. Rev., June, 1903.

² Gaz. degli Osped., Dec. 14, 1902.

³ Jour. of Obstet. of Brit. Emp., April, 1902.

these cases, the uterine vessels are cut out of the circulation, and if there has not been a free hemorrhage during the third stage of labor, blood is returned to the right side of the heart, which may become engorged and paralyzed. Hence, bleeding should be encouraged during the third stage of labor, and if it does not occur from the uterus, and the patient's condition is threatening, blood must be taken from a vein. Attention is called to Hart's illustration of a case of this sort, showing the distention of the right auricle. Aortic incompetence is next in gravity, and mitral incompetence if the heart-muscle is in good condition is less dangerous. Cardiac lesions do not show themselves during pregnancy until after the middle of this time. Then breathlessness, palpitation, cough, and edema appear, with albumin in the urine. The patient may not be able to lie down. The woman who has heart-disease and who has suffered from failure of compensation at any time should be strongly advised not to marry. So far as treatment is concerned during pregnancy, the patient must be kept at rest, the bowels moved freely, the kidneys stimulated, the lungs relieved, and cardiac tonics freely given. Strophanthus is a better drug than digitalis in these cases. While the patient will probably improve, the cardiac tonic must be continued. In a bad case the induction of abortion before the fourth month is permissible. In the later months labor should not be induced. When labor begins, large doses of strophanthus or digitalis should be given. As soon as the os is fully dilated labor should be terminated. The patient should never be allowed to bear down. If the heart begins to be embarrassed before the os is dilated, the os must be stretched open or incised, chloroform given, and delivery at once effected. The uterus should be allowed to relax and bleeding encouraged after the birth of the child. Ergot is contraindicated unless in exceptional cases. If the patient did not bleed from the uterus and showed embarrassment, blood should be taken from the arm. During the puerperal period free stimulation and cardiac tonics should be used. When patients die after labor, it is from acute edema of the lungs and cardiac failure. Nursing should be prohibited, as it influences the heart badly.

Necrosis of the Intestinal Mucosa.—[Although it has been known that pronounced lesions may occur in the mucosa of the gastrointestinal tract due to pathogenic organisms of the pyogenic type, yet no clear knowledge of the cause and course of such conditions has been available. An attempt has been made to classify these cases according to whether the bacteria remained upon the surface of the intestine, giving rise to symptoms by the formation of absorbable ptomaines, or passed into the tissues of the gut and were carried by the lymph and blood to other organs of the body.] H. F. Harris¹ reports the case of a woman about 7 months pregnant who developed the symptoms of uremia, and as she did not respond to treatment and had a very contracted pelvis, cesarean section was done. She recovered from the operation, but in a few days showed signs of a severe toxemia and had numerous liquid stools of a peculiar dark and offensive nature. Autopsy showed a chronic nephritis

¹ N. Y. Med. Jour., Nov. 1, 1902.

with undoubtedly an acute exacerbation. The mucosa of the large intestine showed marked necrotic changes, and in the ascending colon there were intensely ecchymotic areas. In the necrotic masses enormous numbers of bacteria were found, principally diplococci, which corresponded in every way with those described by Escherich as enterococci; although the kidney lesion was pronounced, it is believed that the intestinal lesions were the immediate cause of death.

Pregnancy and Tuberculosis.—[Eighteenth century writers regarded pregnancy as an advantage to phthisical women; it was supposed that if two women were suffering from pulmonary tuberculosis, the one of them who became pregnant was likely to live longest. Modern writers have wholly abandoned this view.] C. Hamburger¹ declares that it is now universally conceded that pregnancy and labor influence unfavorably the course of phthisis, because of their excessive demands upon the vitality of the woman, in virtue of which her susceptibility to tuberculosis is increased. The logical inference is plain: tuberculous women must not have children; if pregnancy occur, it must be interrupted in the interest of the woman. This inference, says Hamburger, is not frankly made as often as it should be. Only recently Kossmann has declared that "pregnancy is only to be interrupted when failure to interfere would inevitably result in the death of the mother during gestation and so cause the death of the fetus as well." Hamburger remarks that the problem must be approached according to the social class of the individual, because the demands during pregnancy upon the strength and vitality of women belonging to the working-class are far greater than upon those of the more fortunate classes. The mortality from tuberculosis increases as the family income decreases. Hamburger therefore undertakes to support his position by giving a series of pictures of the actual life of pregnant working-women, showing how many children they have, what their incomes are, how many persons live in one room or sleep in one bed, and hence what the probable outcome of tuberculosis in such circumstances is likely to be. Von Leyden and others emphasize the especial danger of repeated pregnancies occurring at brief intervals in phthisical subjects, and it is precisely among women of the working-classes that rapidly repeated pregnancies occur. The treatment of tuberculosis in poor women is at best a difficult task. Its difficulties become overwhelming when pregnancy occurs. Good nourishment is indispensable; but during pregnancy there occur vomiting and stubborn anorexia. Working-women are denied good air, bodily rest, concentrated foods, careful nursing in confinement, and rest after confinement. Hamburger considers the dangers of abortion, but does not regard them as serious in comparison with the greater risk of prolongation of pregnancy. It is argued that the probability of renewed conception and the necessity for renewed interference make any interference inadvisable. He replies that it is the duty of the physician to instruct phthisical patients as to the dangers of renewed conception. To those who hesitate to destroy the fetus because of the possibility of its developing into a healthy human being,

¹ Berl. klin. Woch., Nov. 24, 1902.

the writer points out that so far as the children of the poor are concerned such hopes are almost idle, because in this class of society isolation from the mother is an impossibility and hygienic surroundings cannot be provided. For all these reasons he believes that pregnancy occurring in phthisical working-women should be interrupted; its interruption is demanded in the interest of the mother, of the family, and of the community. Löhnberg¹ reports several cases of **laryngeal tuberculosis in pregnancy**. Interruption of the pregnancy, in one case, at least, had no beneficial effect upon the tuberculous process. This is a problem which must be settled by the elements presenting themselves in each case. The main postulates which the author lays down are the prevention, as far as possible, of marriage of tuberculous persons; and in those that are married, to prevent conception. The slightest complaint of laryngeal disturbance on the part of a pregnant woman should be followed by the most scrupulous examination. If a tuberculous process is discovered, the patient must be placed at once in the most favorable hygienic surroundings; if the disease is quite advanced, the well-known methods of treatment must be instituted.

Diphtheria and Pregnancy.—Chambrelet and Micheleau² described the following case: A woman, aged 44 years, 8 months pregnant, was admitted to the hospital on March 1. Eight days previously her throat became sore, and hoarseness, aphonia, and difficulty in breathing soon followed. On admission there were all the signs of laryngeal obstruction, stridor, retraction of the supraclavicular and suprasternal fossas, and turgescient cervical veins. The throat was red, but no false membranes were seen. The temperature was 101.4° F. and the pulse was 120. Antitoxin was injected. Two hours after admission the dyspnea had so increased that tracheotomy was necessary and membrane was expelled through the tracheotomy wound. A second injection of antitoxin was given and the respiration became almost normal. On the following day the temperature had fallen to 97.7° and the pulse to 100. The fetal heart was heard. On the next morning the dyspnea recurred. On the left side of the chest no respiratory sounds could be heard and on the right the respiratory murmur was weak. Aspiration through the tracheal wound failed to remove any membrane. The fetal heart was distinctly heard. After consultation it was decided to induce labor and to make arrangements for cesarean section should death supervene. A long esophageal bougie was introduced into the uterus. The bougie fell out after 2½ hours and no uterine contractions were apparent. Death occurred at 3 A.M. on the following day. An attempt to introduce the hand into the uterus in order to perform version and to extract the fetus failed, since the os was not dilatable. Cesarean section was at once performed. The fetus showed no signs of life and all means of resuscitation failed. The necropsy showed that the larynx was covered with false membrane, but that the trachea was free from it. The bronchi as far as the branches of medium caliber were lined with membrane.

¹ Münch. med. Woch., Feb. 24, 1903.

² Gaz. Hebd. des Sci. Méd. de Bord., May 17, 1903.

The lungs were emphysematous and there was emphysema of the mediastinal tissue. In the small bronchi was a seropurulent exudation. The false membranes yielded on cultivation the long diphtheria bacillus and diplococci. [Very few cases of diphtheria in pregnancy have been recorded. All writers regard the condition as grave. Of 12 published cases in which antitoxin was not used, 6 were fatal; but in 12 cases in which it was used all were successful. An interesting point is the great tendency of the diphtheric process to extend to the larynx, as in children, and contrary to what is usual in adults. Thus, in 12 cases published before the introduction of antitoxin tracheotomy had to be performed 7 times. It is noteworthy that in the case now recorded there were no signs of uterine contraction, although the asphyxia of pulmonary disease is regarded as one of the most important causes of abortion. The diphtheria bacillus was not found in the fetus, but its toxins appeared to have produced profound alterations in the fetal organs. The myocardium showed signs of degeneration. The spleen was congested and the seat of interstitial hemorrhages. The liver also showed interstitial hemorrhages, accumulations of leukocytes in the portal spaces, and degeneration of the hepatic cells. The kidneys showed similar but less marked changes. In the lungs there were interstitial hemorrhages.]

The Kidney of Pregnancy.—In a woman who had remained perfectly healthy J. Veit¹ found that the veins of one of the tubes, which contained a perfectly normal ovum, contained chorionic villi and cells of Langerhans's layer (syncytium) of the ovum. On looking up the literature of the subject he found that this condition has been met frequently, and is regarded by some observers as a normal one. He believes that the syncytium is carried into the maternal blood directly from the placental vessels, but puts aside a discussion of this question as comparatively unimportant as compared with that of the fact that fetal elements can penetrate into the maternal circulation. This fact led him to investigate the subject minutely, and he now publishes the results of his studies. As Veit was struck by the similarity of the conditions in this case and in Ehrlich's experiments with the introduction of foreign blood-cells into an animal, he proceeded to test the result of introducing placental tissue artificially into the body. In order to exclude the action of hemolysin he rendered the placentas as bloodless as possible, and introduced finely divided or pulverized placentas (human and rabbit's) into the peritoneal cavities of rabbits; on a few occasions he injected suspensions subcutaneously and intravenously. Rabbits which received 6 placentas taken from full-time rabbit's uterus always died in 12 hours. When he used 3 rabbits' placentas or 10 grams of human placenta the urine which was secreted was found to contain albumin. He has not yet been able to determine the minimal lethal dose, but found that 7 grams of human placenta were not always sufficient to kill. The albumin appeared in from 40 to 48 hours, and disappeared in a short time afterward. The actual cause of the albuminuria must be toxic, and he regards it as a "lysin," just as red blood-cells when intro-

¹ Berl. klin. Woch., Nos. 22 and 23, 1902.

duced into a strange host produce a body which is capable of dissolving the red cells of the second species, which is also a lysin (hemolysin). The albumin—or, rather, a fraction of the albumin—attaches itself to a “side chain” of the red blood-corpuscle, and thus exercises its poisonous action. There is evidence that this poison is not specific, that is, other tissues can produce albuminuria in rabbits in the same way; for example, the introduction of portions of the umbilical cord and of muscle produces the same result. Further, he found that this body is not present in the serum, as can be shown when the serum of either artificially “albuminurized” rabbits or of eclamptic women is injected into the test-animal, for in this case no albumin appeared in the urine. His experiments dealing with the antitoxin are not yet finished, but he succeeded in preventing the appearance of albumin after introducing human placenta, and in another case, in which he obviously did not employ a sufficient dose, the animal died with albuminuria and convulsions. He does not attribute much importance to the fact of the appearance of the convulsions. It seems a reasonable suggestion that the cells of the peripheral part of the ovum play a part in the genesis of the nephritis of pregnancy; and although he says that there is no ground for believing that the “deportation” of fetal cells, or rather of cells of the periphery of the ovum, can cause actual nephritis, we have to explain the fact that in eclampsia these cells are frequently present in the maternal blood, and that albuminuria has often been noticed with hydatid mole. A further important condition (which has been shown by Wychgel, who carried out the experiment at the request of Veit) is that in the pigmentation of the skin in pregnancy there is an excess of free iron, and Veit believes that this is due to the dissolving action of the syncytium on the red blood-cells, which frees the hemoglobin. Wychgel also found an excess of iron in the urine of gravid women as compared with that of nonpregnant women. Following the matter further, he found that at times the serum of pregnant women contains hemoglobin, while in other cases the serum is turbid, and although it does not contain free hemoglobin, it nevertheless differs from that of nonpregnant women. There are 3 possibilities which could explain the presence of iron in the pigment, etc.: (1) The toxic body, cytotoxin, may contain free iron. That this is unlikely is shown by the fact that while the free iron in the tissues can always be found in pregnancy, hemoglobinemia is seldom met. (2) That the cytotoxins in the process of being cast off from the red blood-cells produce such a damage to the latter that the hemoglobin is set free; and (3) that the cytotoxins act hemolytically. Against the last supposition he mentions that in test-tube experiments the serum of pregnant rabbits does not act as a more powerful hemolytic than that of normal rabbits. He therefore is inclined to regard the second theory as the most probable. In conclusion, he points out that a further study of these phenomena is very likely to reveal important facts, and to lead to great progress in the direction of therapeutics.

The Autointoxications of Pregnancy.—W. A. Potts¹ regards as

¹ Med. Rec., Dec. 6, 1902.

causes of this class of maladies flatulency and constipation, they leading to toxic influences and frequently causing abortion. Pernicious vomiting is another result of toxemia. Colitis and appendicitis, ptialism, cramps, phlebitis, and chorea are all toxic manifestations. As regards eclamptic seizures, the author says that: (1) All cases of eclampsia are found to have recently suffered from constipation, generally of extreme degree. (2) All remedies which have met with any general measure of success are remedies either of elimination or of dilution of toxins. (3) In 85 % of cases of eclampsia examined postmortem, the kidneys, which are the safety-valves of toxin elimination, are found to be diseased. (4) The only other lesions frequently found postmortem are in the liver, the organ chiefly concerned in the metabolic processes; and, lastly, serious disease of organs other than the kidney and liver does not predispose to eclampsia. The obvious consequence of all the foregoing is to bring the eliminative plan of treatment to the front and to place greater reliance upon it than all other measures combined. Potts advises also the use of thyroid extract as increasing excretion and greatly stimulating metabolism.

Pregnancy following Nephrectomy.—Although nephrectomy is such a frequent operation, only 3 cases have been reported in which pregnancy followed the operation. Two further cases are now reported by J. F. Baldwin.¹ In one case the kidney was removed for hydro-nephrosis, and in the other for a pyelitis. Normal pregnancy followed in both cases and the convalescence was uneventful. While numerically insufficient to form a basis for generalization, these 5 cases would seem to indicate that the prognosis of pregnancy following nephrectomy is by no means unfavorable.

Hematuria in Pregnancy.—Bouman² has collected 17 cases in a thesis (Amsterdam, 1901). The blood in all was clearly from the kidney, and disappeared after delivery; it reappeared in several cases in a subsequent pregnancy. Bouman doubts if the blood represents "essential hematuria" as recorded in 5 published cases. In 2 of these cases a kidney was removed and no histologic change detected (Schade, Klempner); in the others nephrotomy was practised, but nothing more done, as the kidney showed no naked-eye appearance of disease (Broca, Loumeau, Debesargues). Whether this affection be a form of hemophilia or due to some neurosis, pathologists cannot as yet determine. Bouman sees no reason to doubt that in his 17 cases of hematuria in pregnancy there was renal disease already existing before conception, though latent or showing very mild symptoms. The pregnancy aggravated the organic affection, either through congestion or autointoxication. The hematuria was noted as ceasing abruptly in one case when the membranes ruptured. In one of Guyon's cases blood reappeared during lactation. Disease of the kidney has been detected in more than one instance; this recurrence of hematuria a year after delivery in another case of Guyon's led to the discovery of tuberculosis of the kidney. Van Herson records a similar case, and Treub reports a recurrence of hematuria without pregnancy. Yff³

¹ Cleveland Med. Jour., May, 1903.

² Monats. f. Geb. u. Gyn., June, 1902.

³ Ibid.

reports a case in which hematuria set in during a fourth pregnancy; it was clearly renal, and disappeared after delivery. It transpired that abortion had been induced in the second month of the second pregnancy on account of renal symptoms.

No Essential Fever of Pregnancy.—Pinard¹ absolutely denies the existence of the fever of pregnancy described by Burns, of Glasgow, in 1809. Tarnier and Budin admitted that fevers in pregnant women offered no characteristic symptoms. Vinay in 1894 showed how modern experience had proved that pregnancy plays an entirely secondary share in the production of the fevers with which it is sometimes associated. Pinard insists that there is distinct danger in maintaining a belief in an essential fever of pregnancy. It may cause the medical attendant to overlook many conditions little known in the days of Burns, such as appendicitis, torsion of ovarian tumors, and dilated tubes, cholecystitis, and other diseases, which often complicate pregnancy and involve rises of temperature. When such a rise occurs, the cause, which is never the pregnancy as such, should be sought for. In the course of 1902 Pinard observed many "temperatures" in pregnant women under his care in the Clinique Baudelocque; many of the patients were nearing term, but some were in very early pregnancy. One woman had distinct fever in the fourth month, and the cause was not clear; apparently there was no local tenderness. An exploratory incision was made, and an ovary full of pus was detected and removed.

Incarceration of a Retroflexed Gravid Uterus.—W. Albert² claims that the physician often fails to cure or uses wrong measures because of error in diagnosis; but diagnosis is not difficult when two points are sufficiently considered: (1) The cessation of the menses; (2) the immediate catheterization of the bladder in obscure conditions of the female pelvis. In incarceration of the retroflexed gravid uterus, naturally the first measure is manual reposition, with or without an anesthetic, according as the case requires. A breaking up of adhesions by the finger may be necessary, and this in many cases may prevent abortion. When manual reposition, however, cannot be effected, or signs of difficulty occur, before resorting to surgical measures the kolpeurynter should be tried. Albert has used it for 5 years in such conditions, and reports 5 cases. The method is simple, but should always be preceded by emptying the bladder and bowel. The rubber balloon of moderate size is introduced between the uterus and the pelvic floor and filled with 200 cc. of sterilized water. If this does not suffice to replace the uterus, after one-half or one hour, it should be repeated with an increased amount of water, 600 cc. being about the limit, until reposition takes place. In the cases reported these measures were employed at an early stage of pregnancy, varying from the second to the fourth month, with restoration of the uterus to its normal position and the continuance of pregnancy. Doléris³ treats this condition by opening the abdomen, separating adhesions, and shortening the round ligaments. He reports a successful case in which the patient, who was

¹ Ann. de Gynéc. et d'Obstét., March, 1903.

² Münch. med. Woch., March 24, 1903.

³ La Gynécologie, June, 1902.

in the third month of pregnancy at the time of the operation, was delivered easily at full term, the uterus remaining in its normal position after involution had occurred.

Tumors Complicating Pregnancy.—[Pregnancy complicated by cancer of the rectum is extremely rare, only 16 well-authenticated cases being reported in literature. This fact is explained on the grounds that cancer usually follows the climacteric, and that carcinoma of the rectum is more rare in women than in men. The proper procedure from the standpoint of obstetrics for cancer of the rectum in pregnant women is, according to Holzapfel, the total extirpation of the neoplasm, manifestly because its presence so narrows the pelvic canal that a living child can otherwise hardly be born. In cases, however, in which the cancer itself does not permit of operation, the indications are to provide otherwise for the birth of a living offspring. These inoperable cancers ordinarily take up a great space in the pelvis, and the birth of a full-term living child through the natural channels is almost always impossible for this reason. It is almost always necessary to perform a cesarean section. Of the cases reported in literature, 7 concerned such an operation. If the carcinoma is advancing so rapidly that the death of the mother is foreshadowed before the end of the pregnancy, cesarean section must be carried out, or, if the birth-canal is still large enough, a premature delivery must be brought about. Another condition is when the child within the womb is already dead, and the mother presents an inoperable cancer. In such cases cesarean section must be performed only when absolutely indicated; that is, when other obstetric operations are no longer possible on account of narrowing of the pelvis. It is to be remembered in this connection that carcinomatous tissue has very little elasticity, and is therefore more easily torn than the normal tissue. Cruveilhier and Kürsteiner both reported great damage to the rectum in their efforts to extract the child under just such conditions. There are, however, many of these cases in which a vaginal operation will permit the delivery of the child with sufficient readiness, and yet with greater safety to the mother than a cesarean section.] Quite otherwise are those cases of cancer, according to Z. Endleman,¹ which permit removal of the growth by surgical measures, a procedure which must be carried out as quickly as possible. The chief question is whether the pregnancy should first be ended and then the growth removed or vice versa. In literature there is only one case of carcinoma of the rectum operated on as late as the sixth month in pregnancy, and that was followed by abortion 4 days afterward, and then on the fifth day by the death of the mother. With only this one case as a guide, it is impossible to say that no operations of this kind should be done during pregnancy. Probably a good rule will be that if the tumor is small and situated low down in the rectum, its removal without interfering with the pregnancy is proper. During such an operation it is necessary to expect greater hemorrhage, because all the organs of the pelvis are in this state more richly supplied with blood. It would also be natural in the

¹ Zent. f. Gyn., No. 32, 1902.

majority of cases to expect abortion, not only through infection, but also through various accidental damages to the womb and its contents. Since the lochia will invade any fresh wound, it is advisable to separate the operations of abortion and removal of the neoplasm by as many days as possible. Whenever during pregnancy there are pains localized in the back and sacral region, and painful stools, Rossa¹ advises an examination of the rectum without delay, the same as in case of like pains in the non-pregnant. A. W. Russell² draws the following conclusions: (1) If cancer of the rectum is discovered early in pregnancy, immediate radical operation should be considered. (2) In advanced pregnancy with a small circumscribed growth the uterus should be emptied before attempting removal of the growth. (3) In advanced pregnancy with a viable child cesarean section and hysterectomy should be performed, and, if possible, inguinal colotomy should follow, and the diseased rectum should be detached from above so as to allow the operation to be easily completed by the vagina according to the method of Rehn or Liermann. (4) When, on the other hand, the disease is beyond radical treatment, the child should be saved by cesarean section or hysterectomy with or without colotomy as may be necessary. (5) If the child is dead and the cancer is beyond operation, cesarean section is still likely to be needed unless labor can be accomplished easily and without undue crushing or laceration by the aid of perforation, embryotomy, or version. (6) With modern improvements in methods of operation better results may be expected than those of allowing labor to take place or inducing it through the natural passages.

Pürckhauer³ analyzes reports of 12 cases of **ovarian tumors complicating pregnancy**, from Hofmeier's clinic, with the following conclusions: (1) An ovarian tumor complicating pregnancy must be regarded as an ever-present danger for both mother and child. (2) Ovariectomy is always indicated, and the prognosis is good even if peritonitis has already developed. (3) Abdominal section should be performed at once if a cyst ruptures during labor. (4) If for any reason ovariectomy is contraindicated during pregnancy, it should be performed as soon as possible after delivery. Of the tumors of the lower abdomen and pelvis which may complicate labor, **dermoid cyst** is certainly a very uncommon one. A case of this class is reported by J. B. Macauley.⁴ The primipara was 27 years old; she had been in labor about 10 hours when first seen; was suffering feeble pains, with a slowly dilating os, and a head-presentation in the left occipitoanterior position. The pains ceased that night, and the patient slept through it. Labor began again the next morning. On examination the patient showed little advance, but was visited every few hours that day, and in the evening the os was fully dilated, and the pains, although very severe, did not advance the head. Chloroform was administered and the forceps applied, but, notwithstanding the use of these instruments, the head did not move appreciably. On relaxing traction on the instrument, without symptoms or warning there appeared

¹ Amer. Med., Dec. 27, 1902.

² Scottish M. and S. Jour., June, 1903.

³ Inaug. Dis.; Zent. f. Gynäk., 1902, No. 32.

⁴ Lancet, Nov. 8, 1902.

at the pelvis a large cyst with a long pedicle. At first it suggested a cystocele, but a catheter did not withdraw urine from it. Then degeneration of the amnion was considered, together with that of placenta prævia, because the cord had already prolapsed as if the placenta were situated low down. An incision was made in the cyst, and a large quantity of matted hair was removed. Then the cyst and its long pedicle was brought down and kept outside of the vulva by means of a ligature. The child was then delivered without difficulty, instrumentally. Death followed in the mother by peritonitis in a few days, and, unfortunately, no autopsy was allowed, so that the precise origin of the cyst within the abdomen cannot be stated. Examination by the vagina seemed to show that traction with the forceps had caused the cyst to rupture through the cervix, and thus pass down the vagina.

Baecker,¹ in reporting 6 cases, states his belief that in spite of the fact that the tumor is benign, **pregnancy in a fibroid uterus** is a condition which is fraught with danger, during both the pregnancy and the puerperium, varying according to the size and location of the neoplasm. Before the third month it is advisable to empty the uterus in a doubtful case. After the third month the expectant treatment should be followed, but if serious complications arise, the writer prefers hysterectomy to a palliative operation, which may expose the patient to the risk of fresh danger from a subsequent pregnancy. Hence, he does not approve of enucleation, even when combined with castration. Of course, the intelligent consent of the patient to a radical operation is necessary. The decision of the operability of fibromyomas of the uterus is difficult even in the presence of modern advanced technic, but when pregnancy occurs to complicate the proposition the seriousness of the clinical question is enhanced. Submucous myomas by altering the endometrium usually prevent conception; subserous forms have no effect on impregnation, but may interfere with later pregnancy and delivery, while interstitial masses especially about the lower segment of the corpus or in the cervix commonly cause very great obstruction in the parturient passage.

H. C. Coe² distinguishes 3 periods of **pregnancy complicated by fibroid tumors**: (1) *Up to the fourth month*: (a) Empty the uterus in the case of large interstitial or broad-ligament tumors, or where they are situated in the lower uterine segment; also in cases of impacted intra-pelvic growths. (b) Small tumors should be enucleated by the vagina, if possible, though pregnancy would usually be interrupted. Intrauterine polypi should be removed, if accessible. (c) Enucleation should be done by the abdominal route. Subperitoneal pedunculated growths should be removed. (d) Impacted growths should be liberated under anesthesia when no adhesions were present, and they should be kept out of the pelvic cavity until they were held out of the way by the growing uterus. The wishes of the patient should be followed as far as this could be done with safety. (2) *Fourth to seventh month*: The location of the tumor is important, as well as its size and variety. Pain and pressure-symptoms furnish indications for treatment. (a) Large interstitial growths. The

¹ Zent. f. Gynäk., No. 38, 1902.

² N. Y. Med. Jour., June 6, 1903.

uterus might be emptied, although the danger of hemorrhage from such a course is greater. (b) He advises enucleation by the abdominal route, and speaks of the propriety of removing multiple small tumors which do not encroach on the uterine cavity. (c) The patient should be kept under observation. She might go to full term and be delivered normally. (d) Impacted tumors, pressing on the bladder, bowel, or ureter, might call for radical operation. (e) Twisted pedicle, degeneration of the tumor, disease of the adnexa, peritonitis, etc., might require interference without reference to pregnancy. (3) *After the sixth month:* Viability of the fetus should be obtained, if the life of the mother is not actually jeopardized. Can the woman be delivered at term? Yes—



Fig. 60.—Fibromyoma obstructing labor, removed by cesarean hysterectomy (Giles, in Clin. Jour. 1902, vol. xx, No. 14).

(a) with subperitoneal growths, if they are not too large and favorably situated; (b) with small interstitial fibroids, if they are not in the lower uterine segment; (c) polypi presenting at the os can easily be removed at any time. (4) *After the eighth month* the Porro-Cesarean operation, suprapubic amputation, or hysterectomy should be performed. Conservatism should be practised here, as in other gynecologic operations, but not carried to extremes. Giles¹ reports an interesting case of fibroid tumor obstructing labor and treated by cesarean section. The child presented by the foot, the tumor lying in the hollow of the sacrum (Fig. 60).

Celiotomy during Pregnancy.—When formerly a surgeon made a mistake in his diagnosis on opening the abdomen and found pregnancy,

¹ Clin. Jour., 1902, vol. xx, No. 14, p. 222.

he quickly closed it and let the case alone, even if some growth or some pathologic condition existed, says J. M. Carstens.¹ To-day we know that operations can be just as safely done as if no pregnancy existed. Tumors are removed that will interfere with delivery, and other acute conditions, such as appendicitis or injury to the bowels, in spite of existing pregnancy, are operated upon most promptly. Carstens has operated in the case of existing pregnancy 21 times with 5 deaths, so that the mortality was over 23 %. He believes that the mortality is less in the more modern cases. These 21 cases were as follows: Appendicectomies, 5; fibroids, 4; hernia, 1; abdominal hysterectomy, 1; ovariectomy, 3; vaginal hysterectomy, 3; miscellaneous, 4. Tumors above the brim of the pelvis, or which can be moved above the brim of the pelvis, need not be interfered with; still, all tumors take on rapid growth during pregnancy, and the increase in size may interfere with the functions of life and then require surgical interference. Christ² considers the relations between pregnancy and operations, especially **dental operations**. Whether extraction of teeth exerts a bad influence upon existing pregnancy, is a question of interest to physicians and dentists alike. He concludes: (1) With a normal uterus any necessary operation may be undertaken. Only in operations upon certain parts which have a special relation to the genital function must the possibility of an interruption of the pregnancy be taken into account. (2) With a healthy uterus the month of the gestation does not make any difference. (3) Whenever necessary teeth should be extracted without considering the pregnancy; so with other dental procedures and operations.

PLACENTA PRÆVIA.

F. Hitschmann and O. Lindenthal³ review the theories of many authors and the observations made upon animals in order to ascertain the normal place of implantation, and the modifying circumstances which cause abnormal attachment of the impregnated ovum. A known development of the impregnated ovum, requiring a definite time, must take place before it reaches the stage of attachment. Under normal conditions the ovum will find itself within the upper segment of the uterus when this stage of development is reached. But if impregnation occurs at an earlier period in the journey of the ovum, or the impregnated ovum meets with unusual hindrances to its passage, the time of attachment will be reached before the normal place of implantation, and then the ovum will attach itself to the lower uterine segment as in placenta prævia, or at a still earlier period in its journey to some portion of the tube as in ectopic gestation. [The normal place of impregnation is not yet certainly determined, neither are the circumstances that control the movements of the impregnated ovum fully known, hence the causes of tubal gestation are still obscure. The statistics touching the frequency of occurrence of placenta prævia are not at all in harmony; for instance,

¹ Am. Jour. of Obstet., March, 1903.

² Boston M. and S. Jour., Sept. 25, 1902.

³ Zent. f. Gynäk., Feb. 28, 1903.

according to Kaltenbach's figures, placenta prævia happens, on an average, once in 1600 cases of labor, while in the famous Rotunda Hospital the proportion is put down as 1 in 175 cases, thus constituting a very wide difference. Without doubt this condition is found much more frequently in a strictly hospital lying-in service, because patients suffering with cases of this character, having foreknowledge of the condition, will voluntarily go to, or be referred to, a hospital as by far the best course to take. For this one reason obstetric hospitals will always show a much larger proportion of these cases than found in private practice. An English obstetrician, however, says that in an experience extending over a period of 22 years, and covering 2067 cases of labor, he has had 13 instances of placenta prævia, one case being very unique, in that placenta prævia occurred in 2 successive pregnancies.] In reviewing the cases at the Sloane Maternity Hospital it was found by F. A. Dorman¹ that placenta prævia occurred in one 1 of 133½ cases. This simply shows the high percentage of operative cases in hospital practice, for the usual proportion is about 1 in 1000. Any condition which tends to interfere with the fixation of the ovum as it comes from the fallopian tube serves as a causative factor. In this series the ratio of multiparity to primiparity was 8 to 1. The diagnosis must be made upon the history of the case and vaginal examination. A history of bleeding during the later months of pregnancy always demands examination, for a second warning may not be given, and a profuse bleeding causes rapid death unless help is at hand. These statistics show a mortality of about 12 %, but it usually ranges between 20 % and 25 %. According to J. S. Rose,² the mortality in recorded severe cases is heavy—50 % (Goodall), 46 % (Stover). On account of the operative interference which is usually necessary in the interests of the mother, the fetal mortality ranges between 50 % and 60 %.

Treatment of Placenta Prævia.—According to Dorman,³ expectant treatment is permissible only before the seventh month in order that the time of complete viability may be reached. Fatal cases before that time are seldom heard of. The induction of labor may be by a vaginal tampon or by a bougie, but the best method is by the Champetier de Ribes bag as modified by Voorhees. With this in the cervix we have a good uterine stimulant and a perfect tampon. One rule laid down as invariable is that the patient should never be left alone till she is delivered, and pregnancy should never be allowed to advance beyond the seventh month. If the bags are not obtainable, the cervix must be rapidly dilated and a podalic version done, so that a leg may be brought down to act as a tampon and stop the hemorrhage. An external version is frequently possible in these cases, because the head remains high up above the pelvic brim. After bringing down a leg the completion of the dilation may be left to nature. The first consideration is to control hemorrhage, and the second is to combat shock, which is so often present. Intravenous injections of salt solution are very beneficial. A comparatively frequent complication is rupture of the uterus on account of the force sometimes used in extraction and on account of the vascularity of

¹ Med. Rec., Aug. 30, 1902.² Brit. Med. Jour., April 25, 1903.³ Loc. cit.

the cervix. As the chances of the child are bad anyway, too great risk should never be taken with the mother in rapid extraction. A suggestion is made that cesarean section might be justifiable if the mother is in good condition, the cervix hard and undilatable, and the surroundings favorable for a laparotomy. J. B. De Lee¹ states that the best way to induce labor is to puncture the bag of waters and introduce the kolpeurynter into the uterus, resting on the placenta and pressing against the cervix, and then to put traction on the tube. Traction should not be too rapid, nor should there be too early delivery. The cervix in cases of placenta prævia is altered so that it is easily distended. The placental site if ruptured is certain to open vessels of some size. The retractile power of the lower segment is slight, and a hemorrhage from such a laceration is often obstinate and severe. In the treatment with Carl Braun's kolpeurynter the instrument is sterilized by boiling for 20 min-

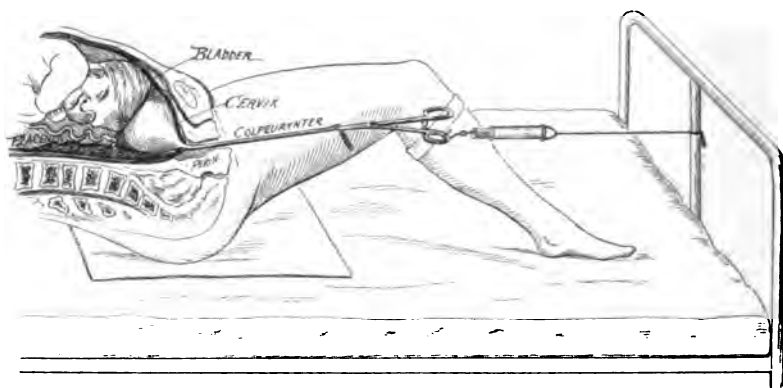


Fig. 61.—Kolpeurynter bag in use (De Lee, in *Am. Gynecol.*, vol. i, No. 2, 1902).

utes, is rolled as compactly as possible, and grasped by forceps, and under the guidance of the index-finger is placed inside the membranes. The bag is then filled with a weak lysol solution, using from 12 to 16 ounces. The head is pushed to one side or directly upward. The tube is clamped with an artery-forceps and traction is made on the bag. The bag acts like the breech, stops hemorrhage, excites pain, and dilates the cervix. If the case promises to take a long time, a tape may be fastened to the forceps and attached under tension to the foot of the bed (Fig. 61). The writer prefers manual traction, relaxing the tension occasionally to allow blood to enter the cervical tissues. The tension ought not to exceed 2 pounds. The bag is commonly expelled in from 2 to 8 hours. When the bag has passed the cervix, and it is found that the head has followed, the case may be left to nature. If the cervix is not dilated completely, a version may be done, or the kolpeurynter replaced and distended with a larger quantity of fluid. A. Kurrer² offers a suggestion which should make the employment of the rubber bag for the

¹ *Am. Gynecol.*, vol. i, No. 2, p. 151, 1902.

² *Zent. f. Gynäk.*, Feb. 14, 1903.

induction of labor a simpler matter. The ordinary method of filling such bags with a syringe requires constant supervision in order to prevent their premature expulsion as the cervix dilates. The author's method is, after introduction of the bag, to connect its tube with an ordinary irrigator filled with sterile saline solution and suspended at 6 feet above the level of the bed. This keeps the bag distended at a sufficient pressure and makes it keep pace with the relaxation of the cervix, so that it cannot be expelled until full dilation is effected. R. L. Dickinson¹ prefers the simple, strong, short cone of Voorhees, which is inelastic, thin enough to slip in, when rolled, wherever the finger-tip will pass, and with no stop-cock to get out of order.

Accouchement Forcé; the Bossi Dilator.—As announced last year (see YEAR-BOOK, 1903), Bossi (Genoa) has invented a new obstetric instrument which may be described as a cervical dilator (Fig. 62), intended for use in certain obstetric cases in which rapid dilation of the cervix uteri and immediate delivery are indicated. Leopold² de-

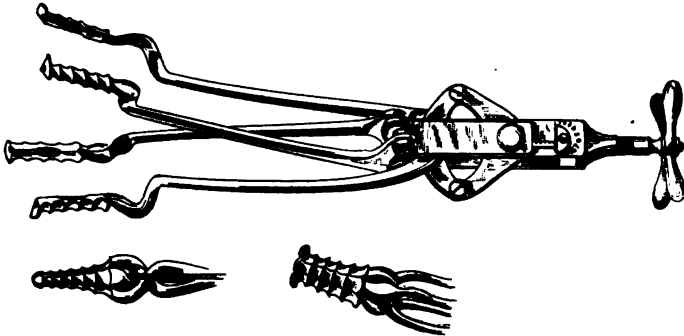


Fig. 62.—The Bossi dilator (Canad. Pract. and Rev., March, 1903).

scribes his use of the instrument. He became impressed with the value of this instrument during a visit to the inventor, when he saw him completely dilate the cervix in a case of pernicious anemia in a multipara in whom it was necessary to deliver the child speedily. In 25 minutes the cervix was completely dilated, the membranes were ruptured, and the patient as soon as possible delivered by forceps. Leopold has tried the instrument in 12 cases: in 7 of eclampsia, 1 of advanced phthisis, 1 of pregnancy with uterine cramp, 1 of labor complicated by fever, and 2 cases of contracted pelvis. The instrument was satisfactory in his hands. Dilation was secured in from 20 to 30 minutes. In 3 cases an unimportant laceration of the cervix occurred which was immediately closed by a stitch. In eclampsia its use was especially successful. In 2 cases the convulsions ceased after the dilation. All the patients so treated recovered. The instrument is composed of 4 arms, which are made to radiate from a center by turning a screw with a circular handle. The extremities of these arms may be covered by

¹ Chicago Med. Recorder, April, 1903. ² Arch. f. Gynäk., 1902, Bd. lxvi, Heft 1.

additional pieces having corrugations of considerable size, which prevent the instrument from slipping. It may be inserted without these pieces, and these may be added as dilation advances. The instrument can be introduced when the os will admit one finger. J. B. De Lee¹ has made a careful study of reported cases of the use of this instrument and has used it himself 3 times. He reaches these conclusions: (1) There is a small field of usefulness for this instrument in cases in which rapid dilation of the cervix is necessary after effacement. Before effacement the kolpeurynter should be used. It will be more successful in multiparas. (2) The instrument will be useful in dilating the cervix in those cases in which manual dilation would be successful. It possesses advantage over the hand in the asepsis, and in that it is not so tiring, so that the operator may carry out the subsequent delivery comfortably. (3) The instrument is not safe, but requires careful and skilled watchfulness, and one must search for and be ready to repair more or less extensive lacerations. These are greater in primiparas. (4) It should never be used in placenta prævia. (5) It does not replace the kolpeurynter, the use of the hand, or cervical incisions in all cases. Ludwig Knapp, Wagner, C. W. Bischoff, H. Langhoff, and A. Mueller² discuss Bossi's new method. They praise it individually and collectively, and bring reports of cases to bear upon their views. In the hands of all it has been most successful. The main indications for the use of the instrument, as brought out in the papers, are protracted labor with danger to mother or child, eclampsia, and placenta prævia. In some cases a laceration of the cervix could be subsequently demonstrated, but in all cases a rapid dilation was accomplished. An unopened cervix can be fully dilated in from 20 to 30 minutes. A. Ostreil³ reports 4 cases in which he used Bossi's or Frommer's dilators, 3 times for eclampsia and once for tetanus of the uterus. Ostreil employs the rapid dilators only for eclampsia, preferring the metreurynter for cases of placenta prævia. The 4 patients recovered. Leopold Meyer⁴ also refuses to use Bossi's instrument in placenta prævia or for the induction of premature labor, although he thinks the fear of hemorrhage from laceration of the cervix has been exaggerated. Meyer has used the instrument 15 times, 6 times in eclampsia, twice in cases of infection, twice in placenta prævia, twice in heart-disease, twice in pyelitis, and once for accidental separation of the placenta. Two of these patients died, the rest recovered. Meyer saw, in no instances, hemorrhage from cervical tears. Rissmann⁵ gives the history of 3 cases in which he used Bossi's instrument, describes the method of introduction, and claims this advantage, that its use enables one to see the pulsation of the fetal head and thereby to determine by sight whether the child is living. But there is also the disadvantage that in this procedure there is no thinning of the edges of the os uteri; they remain thick and the obliteration of the os never occurs. There is danger of cervical laceration if delivery takes place immediately after the dilation. He

¹ Chicago Med. Recorder, April 15, 1903.

² Zent. f. Gynäk., Nov. 22, 1902.

³ Zent. f. Gynäk., March 14, 1903.

⁴ Loc. cit.

⁵ Zent. f. Gynäk., July 12, 1902.

advises waiting after the dilation, perhaps using the kolpeurynter meantime, until there are strong frequent pains before the extraction of the child. With proper care in its use, Rissmann considers that the addition of Bossi's dilators has enriched our obstetric instrumentarium. Zange-meister¹ calls attention to the fact that in the dilation of the cervix there are always more or less bloody lacerations. By the use of Bossi's and Frommer's instruments, although he dilated very carefully, he regards the danger as double, involving not only a laceration but the danger of sepsis as well. He prefers the use of intrauterine balloons of the various patterns, combining dilation with some tugging. [The instrument is undoubtedly powerful and able to accomplish the object for which it was designed. The chief criticism which we would offer, but this unquestionably is potent, is that the mechanism of the dilator is very complicated, and the instrument is so constructed, with its numerous parts (many levers and screws), that it is practically impossible to take it apart for cleaning. This feature renders strict asepsis impossible, which is of course a *sine qua non* in any surgical instrument at the present time. The instrument is of metal and may be boiled, but its many slots and crevices will harbor surgical dirt, so that in a short time mere boiling would be inefficient. It is surprising that this very objectionable feature of the instrument has not elicited criticism before.]

Cesarean Section in Placenta Prævia.—Schauta² questions the value of cesarean section in this condition, and says that for many years he has used the method of bimanual version, followed by the attachment of a weight of about 3 pounds to the fetal leg which is brought down through the vagina. The expulsion of the fetus, assisted somewhat by the continued traction exerted by the weight, is left to the natural sources until the umbilicus emerges from the vulva. From this point the case is managed in accordance with the usual method of dealing with breech-presentations. A compilation of his cases during the past 10 years shows a total of 234, of which 16 ended fatally. In some of these cases placenta prævia could hardly be credited with the mortality. Even allowing this, however, the percentage, 6.8, is not a high mortality, especially in view of the condition in which the patients are brought to the hospital. The advocacy of cesarean section in all cases, which necessarily includes all cases in which the simplest opening of the amniotic sac suffices to stop the hemorrhage, hardly deserves serious consideration. He limits his remarks, therefore, to severe cases of central or total placenta prævia. To replace version by cesarean section in these cases would only add dangers to those already existing. The operation cannot be at once performed even in well-equipped hospitals, while version is always available. Deep narcosis is necessary and there must be a certain amount of blood lost, for often copious hemorrhage cannot be avoided. The placenta must be peeled off after removal of the fetus with the danger of uterine atony. He does not perform conservative cesarean section in patients who were handled before entrance by untrustworthy people, provided the indication for operation is not absolute.

¹ Zent. f. Gynäk., Jan. 24, 1903.

² Canad. Pract. and Rec., Sept., 1902.

Very few cases brought to the hospital conform to this indispensable requirement. The question whether the section promises to reduce maternal mortality in these cases he thinks must be answered in the negative. As regards the chances of the fetus, he believes that they would be better if cesarean section could be performed immediately on the appearance of the first hemorrhage, but if we look over the reports of cases we find that only a small number of these children are fully developed. In his 234 children, only 92 were matured, and the mortality of premature children is much more in these cases because they suffer from asphyxia due to the partial separation of the placenta from the uterus, and, therefore, he holds that we would not obtain better results as regards fetal mortality by operation. P. E. Truesdale¹ believes that cesarean section is the operation of choice in the treatment of placenta prævia, complete or partial, when the child is viable and when dilation and version, performed with sufficient rapidity to save the child's life, are rendered impossible by the pelvic diameters and the condition of the soft parts. In the hands of experts the mortality in complete placenta prævia treated by version is, for the mother 18.9 %, and for the child between 65 % and 70 %. In partial placenta prævia the maternal mortality is probably not over 5 %, but the infant mortality in such cases probably is as high as 50 %. It is the high mortality of version, in complete placenta prævia, that makes cesarean section a rational method of procedure. Lateral insertion of itself does not justify section. [So far, there have been reported 13 cases of cesarean section for placenta prævia. In these the maternal mortality was 44.4 %, and the infant mortality also 44.4 %. These figures are, however, misleading, as in one case the operation was undertaken as a last resort when all other means had been tried, and in another case there was probably malignant disease of the cervix. In these two cases both mother and child were lost. In the second the child was shown to have been dead 2 days before operation. Truesdale excludes these two cases on the ground that they do not give fair statistics. The revised showing is, then, 11 cases with a maternal and fetal mortality of 22.2 % each.]

ABORTION.

[While we may fully agree with the contention of a recent earnest writer that abortion is greatly increasing and that everything possible should be done to mitigate the evil, at the same time it must be admitted that the medical profession has within its own ranks the very worst offenders. While the newspaper advertisements of abortifacients should be by law prohibited, and the sale of such substances by druggists and others strictly curtailed or annulled, at the same time it must not be lost sight of that altogether too many calling themselves physicians, and legally entitled to the name, are engaged in the nefarious work directly and indirectly. To be sure, no man or woman morally deserving the name of physician will lend himself or herself to such practice, and

¹ Boston M. and S. Jour., April 2, 1903.

there is a very strong feeling in all medical circles touching such proceedings. A practitioner cannot long extend this kind of aid (?) to those applying to him without the fact becoming known to all other physicians in his vicinity, however much he may try to conceal his ill-doing, and that professional sentiment is against him will be shown very freely. But this does not alter the fact that such work, in the eyes of non-discriminating people, lies within professional borders, as in truth, viewed in one way, it does. The question then remains, that the medical profession as a whole should devise some way of clearing its own skirts before berating others for their misdoings in this direction. We may condemn newspapers as a class for their conscienceless aid to the exploitation of murder-producing means; we may denounce the druggists for readily, even eagerly, selling to whoever applies drugs of this class; but—as a profession—we are not a little inconsistent if we do not first drive out every offender from under our own roof. And this is a great question, and has been for a long time. Professional ostracism does something, of course, but the offender remains a recognized “doctor” in a legal, and perhaps common, sense, and goes right along doing the same business it may be for years, until finally a death happens under suspicious circumstances, calling for a coroner’s investigation, when the culprit either suffers the due penalty of the law, is helped out of the fix by cronies, or leaves for parts unknown. And thus it continues; and thus a lasting blight upon the honor of the entire profession obtains.]

Recurrent Abortion.—The classification of recurrent abortion as given by John W. Taylor¹ is more rigid and severe than is usually seen. He includes under the title of recurrent abortion only those cases in which from the beginning or from some definite epoch the patient has aborted with every succeeding pregnancy, and with one exception only has restricted it to cases of initial or primary recurrent abortion; that is, to patients who from the beginning of their married life until the date of coming under observation have never been able to bear a living child at term. The so-called “habit” in cases of syphilis, especially when the patient is under treatment, tends to alter with each succeeding pregnancy; recurrent abortion, then, is a better term than habitual abortion. Of the rare forms of recurrent abortion a few are due to intraperitoneal adhesions, chronic kidney-disease with albuminuria, and a deep laceration of the cervix. When all these rarer forms of recurrent abortion are accounted for, and when syphilis can be readily excluded, there still remains a definite group of cases of very nearly equal importance to that belonging to syphilis. The distinguishing features which bind these cases together are indications of low vitality on the part of the mother or father or both parents, a strumous family history, and what he calls the remarkable result of an essentially “antistrumous” treatment when carried on for a long period of time or throughout the whole of pregnancy. Twelve of the latter type of cases are tabulated. In syphilitic cases each succeeding abortion, if the patient’s general condition remains satisfactory, tends to occur at a later period until the

¹ Brit. Med. Jour., April 11, 1903.

pregnancy goes to term. At this stage dead children are usually born, but finally living children may be expected. In the "strumous" class unless something is done to improve the general health, each abortion tends to further weaken the patient, each succeeding abortion tends to occur at an earlier period, and finally in some untreated cases the power of conception is lost.

EXTRAUTERINE PREGNANCY.

Interesting cases of ectopic pregnancy are recorded as follows: Demons and Fieux,¹ a case of pregnancy developing in a tubal diverticulum; E. E. Evans,² a lithopedion in the right broad ligament removed 33 years after the pregnancy; Aspell,³ a fatal case of hemorrhage in a tubal gestation which was unruptured, the hemorrhage coming from a ruptured vessel at the end of the fallopian tube (tubal abortion?); Gyse-lynck,⁴ a tuboabdominal pregnancy unruptured at the end of 6 months; Steffeck,⁵ M. von Holst,⁶ and Wimmer⁷ each a successful case of interstitial (tubouterine) gestation; Holst's patient subsequently passed through a normal pregnancy; Galeazzi,⁸ an old case of ectopic pregnancy which had ruptured into the bladder from which fetal bones were extracted; Banga,⁹ rupture of a tubal pregnancy 7 days after missing one menstrual period; F. J. McCann,¹⁰ the second case ever recorded of hematosalpinx due to tubal pregnancy complicated by twisted pedicle, 3 twists being noted (see Fig. 63).

Cases of recurrent extrauterine pregnancy are reported by B. H. Wells,¹¹ H. C. Coe,¹² and Harris.¹³ [The literature upon this subject seems to be very meager or, rather, the information which would be helpful in settling several etiologic questions is lacking on account of the operators' carelessness in not thoroughly examining the other tube at the time of operation and submitting the specimens to careful microscopic examination.] Of the various theories which have been advanced relative to the causation of ectopic gestation, Wells believes that the most potent factor probably results from a change in the epithelial lining of the tube following upon a mild infection of that duct and causing an increase in the time occupied by the passage of the fertilized ovum through the tube.

Double Extrauterine Pregnancy.—Two instances of this extremely rare condition are reported, one by Maire,¹⁴ the patient having a bicornate uterus, and one by K. Kristinus.¹⁵ Kristinus's patient, a woman of 30 years of age, was the mother of 4 children, and her last menstruation occurred on March 1, 1902. During the last week in April there was

¹ Ann. de Gynéc. et d'Obstét., Oct.-Nov., 1902. ² Amer. Med., April 11, 1903.

³ Am. Jour. Obstet., May, 1902. ⁴ Jour. Méd. de Bruxelles, Dec. 11, 1902.

⁵ Zent. f. Gynäk., No. 16, 1903. ⁶ Münch. med. Woch., No. 10, 1903.

Ibid., No. 2, 1903. ⁷ Giorn. dell. R. Accad. di Med. Torin., Jan., 1903.

⁸ Chicago Med. Recorder, Dec. 15, 1902.

⁹ Lancet, May 9, 1903.

Med. Rec., Nov. 22, 1902.

¹⁰ Ibid., Nov. 15, 1902.

¹¹ Am. Gyn., April, 1903.

¹² Bull. de la Soc. d'Obstét. de Paris, Jan. 16, 1902.

¹³ Wien. klin. Woch., No. 47, 1902.

a bloody discharge which was thought to be menstruation, but it was followed by weakness and dizziness. The hemorrhage continued, and a membrane was discharged, which was thought to be the remains of a fetus. On the third day the patient left her bed, though suffering from pain in the back. Later she was taken with severe pain in the abdomen, took to her bed, and was soon unconscious. The signs of internal hemorrhage being pronounced, she was taken to the hospital, where a diagnosis of a ruptured tubal pregnancy was made. Upon opening the abdomen it was found to contain much fluid blood with some coagula. After this was removed there was perceived a sac connected with the left tube, closely united with the ovary. This sac was intact. After this was removed the right tube was brought well into view, and was found to be likewise the seat of an extrauterine fetus. There was a small opening in the sac, through which the blood had escaped.

A. Psaltoff¹ at the fourteenth International Medical Congress, Madrid, recorded a case of bilateral extrauterine pregnancy which was in reality a recurrent case with an interval of about 3 years.

Coexisting Extrauterine and Intrauterine Pregnancy.—Cases of this rare combination are reported by Vasten,² K. Reifferscheid,³ G. J. Hagens and J. J. Moorhead,⁴ J. Phillips,⁵ G. S. Peck,⁶ J. B. Morrison,⁷ and G. B. Marshall.⁸ In Morrison's case the ectopic pregnancy was of the interstitial variety. Straus⁹ states that no fewer than 32 instances of tubal pregnancy co-

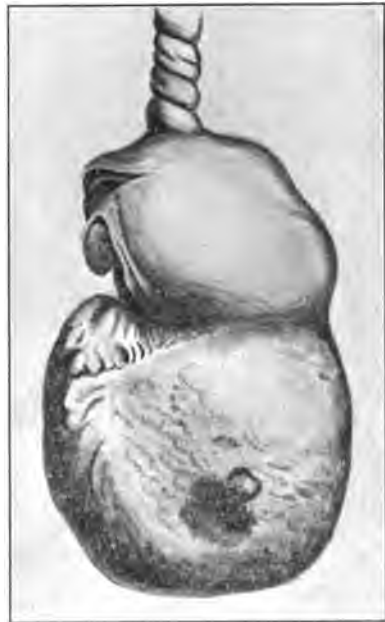


Fig. 63.—Tubal gestation with twisted pedicle. The figure represents the natural size of the tumor and shows the three twists in the pedicle (McCann, in *Lancet*, May 9, 1903).

existing with intrauterine gestation appear in literature. In Straus's table the maternal mortality amounts to 14 in the 32, but 10 of the 14 were in cases dating from 1820 to as far off as 1879. In 13 cases both extrauterine and intrauterine pregnancies continued to term; in 4 both fetuses were living, and out of these 4, only 2 were cases in which both fetuses were delivered alive, the one normally, the other by abdominal section. But one mother was lost out of these 2 cases. In 3 cases one pregnancy alone continued till term,

¹ *Med. Rec.*, May 30, 1903.

² *Zent. f. Gynäk.*, March 21, 1903.

³ *Lancet*, Oct. 25, 1902.

⁴ *N. Y. Med. Jour.*, June 27, 1903.

⁵ *Bol. Gaz. Bol.*, No. 40, 1902.

⁶ *Jour. Am. Med. Assoc.*, May 23, 1903.

⁷ *Amer. Med.*, Aug. 9, 1902.

⁸ *Lancet*, May 2, 1903.

⁹ *Zeit. f. Geb. u. Gynäk.*, 1900.

in 2 it was the normal gestation, in 1 uterine abortion occurred at the sixth week and the tubal pregnancy continued to term. In 5 cases the simultaneous pregnancies were diagnosed before uterine labor or operation. In 9 cases the diagnosis was made after spontaneous termination of the uterine pregnancy. In 6 cases it was not made at all, being discovered at necropsy; in 6 cases it was detected during abdominal section, in 2 after abortion of the uterine pregnancy, in 2 at an abdominal section after abortion, in 1 after detachment of the placenta from the uterine cavity, while in 1 intrauterine pregnancy was not detected until 2 months after the tubal sac had been removed. This is the only case in which, after that operation, uterine pregnancy continued to term. The child was living and was reared.

Twin Tubal Pregnancy in the Same Tube.—Ersilio Ferroni¹ reports a case of twin pregnancy. In the third month of gestation left ovariopalingectomy was performed. The tube removed contained two fetal sacs apparently unconnected, and the portion of the tube between them was in a normal condition, but both openings were stopped with blood-clots. The two fetal sacs were unequal in size, and showed different stages of development. It appeared that in the larger sac abortive changes with the death of the embryo had occurred, while the other advanced to a later stage of development before a fresh lesion led to further abortive changes and symptoms requiring operation. The question whether both ovums came from the same or different ovaries at different times is also discussed. The symptoms of the patient were those of an ordinary ectopic gestation, and it was only the anatomic examination which made known the existence of a twin pregnancy.

Abdominal Pregnancy.—Witthauer² claims to have observed a genuine case of primary abdominal pregnancy. [Ten years ago it was taught that all ectopic gestations were primarily tubal, so that there could be no such thing as a primary ovarian or abdominal pregnancy. But Van Tussenbroek has demonstrated the possibility of primary ovarian pregnancy, and several genuine cases have recently been recorded. As for a fertilized ovum developing in the abdominal cavity between the ovary and the tube, such a condition has not been demonstrated until the publication of Witthauer's case. J. W. Taylor, of Birmingham, considers that "arrest in the abdominal cavity between the ovary and tube is probably fatal at once to the unprotected ovum, and consequently may be eliminated from discussion." He describes abdominal pregnancy as always secondary. A tubal sac ruptures, and the ovum manages to escape into the abdominal cavity without damage to the placenta. The fetus may in such a case continue to develop, but the placenta always remains connected in part with the tube. Giles and Bland-Sutton do not recognize a primary abdominal pregnancy in the last edition of their manual.] Witthauer takes up another challenge. Referring to a passage in Alban Doran's paper³ on a fetus found in the peritoneal cavity he remarks that the author admits that when a minute but recent

¹ Zent. f. Gynäk., Feb. 28, 1903.

² Zent. f. Gynäk., Jan. 31, 1903.

³ Trans. Obstet. Soc. of London, vol. xxxv, p. 237.

and entire fetus is to be seen lodged in a true gestation-sac inside the ovary or on the peritoneum away from the tube, then we shall begin to believe in primary ovarian and abdominal gestation. Since those works were written a gestation-sac has been detected in the ovary more than once. Witthauer insists that in his case, though the fetus had disappeared owing to the early stage of the pregnancy, he found abundant products of gestation in a blood-clot wrapped up in a corner of the free edge of the omentum. The patient was 23; the period returned 6 weeks after her second pregnancy, but ceased 10 months later. In about 6 weeks an irregular discharge of powdery dark blood was noted, followed by violent pains and anemia. The patient was taken into the hospital; a tumor was detected in Douglas's pouch and the right fornix. The next day symptoms of internal hemorrhage were observed. Abdominal section was therefore performed; over two pints of blood and clot were found free in the peritoneal cavity. A tag of omentum was found adherent to the pelvic viscera to the right of the uterus. The right ovary was converted into a cystic tumor of the size of a hen's egg, and was removed with the tube, which was perfectly normal. The left appendages were healthy; the uterus was not appreciably enlarged. No source of hemorrhage could be detected in the uterus or its appendages, but rolled up in the piece of omentum which adhered to the pelvic organs was a small hematoma, described as of the thickness of a thumb. The patient recovered, and has recently become pregnant for the fourth time. The hematoma was found to contain abundant chorionic villi, inclosed in a capsule of clot, itself encapsulated in omentum. The ovum itself had escaped. The corresponding fallopian tube was quite healthy, patent, but undilated, and no chorionic villi could be detected in its walls. In association with this case we may turn attention to Kamann's communication¹ on apparent secondary abdominal pregnancy in a rabbit after primary rupture of the uterus. He gives his reasons for believing that the fetal sac did not originally develop in the omentum, but that the pregnancy originated in the uterus, which ruptured and permitted the escape of the ovum into the peritoneal cavity. J. W. Taylor, while declaring, as above stated, that the unprotected ovum in the peritoneal cavity is speedily killed, considers that secondary abdominal pregnancy may be established when a fetus escapes from a tubal sac inclosed in its unruptured membranes; not only must the membranes be intact, but the placenta must retain its attachment to the tube and receive sufficient blood-supply from the maternal bloodvessels. In Witthauer's and Kamann's cases the fetal sac had no connection of any kind with the tube or uterus. [Witthauer's explanation of his case, which deserves careful study, will not absolutely convince skeptics, for he admits that tubal abortion was suggested by some of the symptoms, yet relies on the fact that the tube was perfectly healthy. We know that when a gravid tube discharges an ovum it becomes reduced to its normal size very rapidly. Still the total absence of any histologic products of conception in the tube supports Witthauer's opinion; in other words, it is

¹ Brit. Med. Jour., March 7, 1903.

probable that in this case a fertilized ovum became primarily implanted on the omentum. It is singular that hemorrhage so severe proceeded from so small a body as this hematoma; the same phenomenon is observed when the tubal gestation-sac ruptures. This case must be borne in mind for medicolegal reasons, when a case of death from intraperitoneal hemorrhage occurs in a woman, and the ovaries and tubes are found free from any gestation-sac. Such a sac may possibly be found elsewhere, and it may be very small, though the seat of origin of the fatal loss of blood.] A. L. Galabin¹ states that until the report of Witthauer's case of primary abdominal pregnancy such a condition had not been demonstrated. He reports a case which he considers presents strong presumptive evidence that primary abdominal pregnancy occurred. The patient died from hemorrhage, and a thorough examination of the pelvic viscera was made. The gestation-sac was placed between the uterus and rectum, occupying the whole of the pouch of Douglas. There was a fetus 5.5 cm. ($2\frac{1}{4}$ inches) long, apparently at the tenth week of gestation. Both tubes and ovaries and the mesosalpinx were normal, with the exception that the right ovary contained two small cysts. Neither tube showed signs of recent dilation. The specimen was examined by a committee of the Obstetrical Society, which reported that the pregnancy was probably a primary abdominal one. It was held possible that a tubal abortion had occurred at a very early stage of gestation and that the ovum had been transferred to the bottom of the pouch of Douglas. The author states that obviously such a possibility cannot be excluded from any apparent case of primary abdominal pregnancy. Other evidences of primary abdominal pregnancy were that the fetal sac consisted externally, outside of the chorion, of a membrane the outer surface of which was smooth, somewhat polished, resembling peritoneum. There was no part of such sac, however, in the ovary, and a space nearly 2 cm. ($\frac{3}{4}$ inch) of normal broad ligament intervened between the ovary and the nearest part of the placental site.

Interesting cases of **secondary abdominal pregnancy** are reported by C. P. Noble,² W. L. Estes,³ Doktor,⁴ Stankiewicz,⁵ Ullmann,⁶ Ols-hausen,⁷ and Sittner.⁸ Sittner adds 16 to the previous 126 cases of extrauterine pregnancy which were ended by laparotomy, with the fetus living at the time of operation. These belong to a period since 1813. Of the 16 cases, 1 illustrated the rare form of pregnancy in the hernial sac in the inguinal region; in 7 the fetus had developed to an advanced stage in the original sac, 5 of these in the uninjured tube, 1 in the ovary, and 1 in the ovarian tube; in 8 the fetus was outside the original sac, twice through rupture into the broad ligament and in the other cases into the abdominal cavity, where the fetus lay completely free in 4 instances; in 2 with the placenta attached to an abdominal organ. One case was especially interesting, as the fetal sac was found

¹ Brit. Med. Jour., March 21, 1903.

² Ibid., Dec. 13, 1902.

³ Monats. f. Geb. u. Gyn., Dec., 1902.

⁷ Zent. f. Gynäk., No. 20, 1903.

⁵ Phila. Med. Jour., May 30, 1903.

⁴ Zent. f. Gynäk., No. 31, 1902.

⁶ Ibid., vol. xv, Supplement, 1902.

⁸ Ibid., Jan. 10, 1903.

between the liver and the right kidney, to which it was firmly adherent. The placenta was about two-thirds attached to the peritoneal fold between the right under surface of the liver and diaphragm, and one-third to the tissue of the under surface of the liver itself. The sac contained a living fetus. The maternal mortality in these cases was about 33 %, a very high death-rate, probably largely due to the bad condition of the patients when brought to the hospital. Of the children, 7 had not reached an age to live after delivery. Of the others, 3 died after a few hours, 1 after 3 weeks of gastroenteritis, and 4 are still living.

Ovarian Pregnancy.—[The existence of ovarian pregnancy has been contested, and many supposed cases have been proved to be tubo-abdominal, with intimate but secondary adhesions to the ovary. According to Kelly, in order to prove the existence of an ovarian pregnancy it is necessary to demonstrate the criterions laid down by Spiegelberg, viz., that the tube is intact and has no organic connection with the gestation; that the tumor is connected with the uterus by the utero-ovarian ligament; that the walls of the sac contain graafian follicles in various places; and that the albuginea of the ovary passes directly into the tumor-wall. In the very full collection of the museum of Vienna, Bando found only one specimen of ovarian pregnancy and almost questioned the possibility of its existence. A. Martin found one instance of ovarian pregnancy in 77 cases of extrauterine gestation coming under his personal observation, and cases have been satisfactorily demonstrated by Sanger, Leopold, Mackenrodt, van Tussenbroek, and others. Quite recently John F. Thompson, of Portland, Maine, (see abstract below) has added an interesting case in which careful microscopic examination demonstrated an ovarian gestation. Although the clinical interest of differentiation of the type of ectopic gestation is not great, the scientific value is sufficient to demand a patient investigation of every case likely to prove one of this interesting and exceptional variety.] Thompson¹ has demonstrated by careful microscopic examination a case of ovarian gestation. The patient was a multipara, aged 32 years, and the pregnancy occurred in the left ovary. No rupture had taken place previous to the operation. Just inside of the base of the tumor was a small opening on the surface of the ovary with ectropion of the lining of the graafian follicle. The fallopian tube was unobstructed in its movement, freely falling forward when the specimen was raised by grasping the ovary. The fimbrias were entirely free from one another and the tube was patulous. The fetus was found attached to the wall of the ovisac by an umbilical cord 1.5 cm. in length. The fetus itself measured 1.2 cm. in length, not extended. Its appearance was exactly similar to a fetus of the same age developing in the uterus. The points which substantiate the claims of this individual case are: The tube is not concerned in the development of the pregnancy; there is no supernumerary tube; the pregnancy undoubtedly did not occur at or near the fimbriated end of the tube, as the sections made from the tube near the fimbriated end showed no evidence that the structure had been the

¹ Am. Gyn., July, 1902.

seat of pregnancy; the fimbriated end was found at the time of operation to be entirely free from the ovary, so that the case is not one of tubo-ovarian pregnancy; the fimbria ovarica in this case is found in what must be considered its normal place, extending from the end of the tube to the outer end of the ovary; the pregnancy has occurred at the extreme inner end of the ovary; there is no evidence to be derived from the examination of sections of ovarian tissue that the fimbria ovarica has passed up over the surface of the ovary; an examination of more than 100 sections from different parts of the wall of the ovisac shows no cells which can be considered as decidual; there is no trace of decidual tissue to be found in any part of the specimen examined. Other interesting cases of supposed ovarian pregnancy are reported by Simon,¹ Gottschalk,² Fùth,³ Mendes de Leon and Holleman,⁴ and J. Oliver.⁵

Ectopic Gestation: Its Diagnosis and Treatment.—Harrison⁶ confines his remarks to tubal gestation in its earlier months. If, as rarely occurs, the physician is consulted in cases of tubal pregnancy before the death of the ovum, the diagnosis may be made with a near approach to accuracy if menstruation has been absent once or twice; if the uterus is soft, enlarged, and somewhat elongated; if there are subjective and objective signs of pregnancy; and if there is felt a soft tumor involving one tube, with strong arterial development. The soft elasticity of the tumor is almost pathognomonic. One symptom to which Veit draws attention is a transitory hardening of the tube. The death of the ovum is proved conclusively when a tumor originates suddenly without fever and with the attendant signs of acute anemia, then becomes hard, undergoes diminution, or remains constant, and when, in addition, there is a discharge of dark tar-like blood by the vagina. A very important symptom is urinary tenesmus, a constant symptom due to the sudden interference with the capacity of the bladder consequent on the development of the hematocele. Most authorities are agreed in the opinion that so soon as a pregnant tube is certainly recognized it should be removed at once; for the simple reason that it is not within our power to ward off the dangers that menace the life and health of the patient by any means short of radical intervention. For the operation the author prefers the abdominal route. In cases of rupture of the tube the same principles that guide us in general surgery are applicable. Champneys⁷ contributes an interesting paper upon this subject, with the results of his study of 75 cases of tubal gestation from the wards of St. Bartholomew's Hospital. He calls attention to the fact that more than 20 years ago these cases were diagnosed as hematocele, while later the same cases were called perimetritis. Before 1893 the diagnosis of ectopic gestation was not very commonly made. From 1865 to 1877 there were at St. Bartholomew's Hospital 129 cases in

¹ Zent. f. Gynäk., No. 50, 1902.

² Ibid., No. 49, 1902.

³ Monats. f. Geb. u. Gyn., May, 1902.

⁴ Rev. de Gyn. et de Chir. Abd., May-June, 1902.

⁵ Lancet, May 23, 1903.

⁶ Brit. Med. Jour., Oct. 11, 1902.

⁷ Jour. of Obstet. of the Brit. Emp., June, 1902.

which hematocele was diagnosed, and of these 5 were fatal—a mortality of nearly 3.87 %. During the next 2 years the mortality remained the same, but a smaller number of cases were diagnosed as hematocele. From 1891 to 1900 there were 36 cases of hematocele, of which none was fatal. During the first 12 years the diagnosis of ectopic gestation was made 6 times, with 1 death. During the second 12 years it was made in 10 cases, with 2 deaths, and during the next 9 years in 63 cases, with 9 deaths. Champneys practises and teaches the following principles of treatment in these cases: (1) Cases of early, unruptured, living tubal gestation should be operated on without delay. (2) Cases of rupture into the peritoneal cavity with diffuse hemorrhage should be dealt with according to circumstances: (a) if hemorrhage still continues when they come under observation some cases ought to be subjected to operation, taking into consideration the probability of the limitation and encapsulation of the blood continuing and the state of the patient at the time; (b) if seen after hemorrhage has ceased they should be treated expectantly. (3) Cases in which the blood has been encapsulated by adhesions or by the broad ligament should be treated expectantly, and operated on if pregnancy appears to be progressing. (4) Hematoceles which refuse to be absorbed in a reasonable time should be opened, emptied and drained. In explanation of these propositions it is recognized that it is very difficult at times to diagnose an unruptured tubal gestation. Regarding those cases which rupture into the peritoneal cavity, the death of the ovum immediately occurs; hence it ceases to be a source of danger. If the patient recovers from the shock, she usually survives the accident. To operate during the stage of shock he believes is in many cases to kill the patient; to operate after the shock has ceased is usually unnecessary. Champneys adds detailed reports of 75 cases which have been under his personal charge in St. Bartholomew's. The mortality of these cases was 7, or 9.3 %; 45.3 % of these cases were left alone and recovered; in 20 % vaginal section was done, without mortality; in 65.3 % nothing was done as soon as the patient was admitted or during the active stage of hemorrhage, but later on vaginal section was performed. Immediate abdominal section was done in but 12 % of the cases. Secondary abdominal section was done in 22.6 %, and abdominal sections, both primary and secondary, in 34.9 %. There were 49 cases, or 65.3 %, in which abdominal section was not done. The mortality of vaginal sections was nothing, and the mortality of abdominal sections, primary and secondary, was 26.92 %. Primary abdominal sections gave better results than secondary. In the former the mortality was 22.2 %, and in the latter 29.41 %. The mortality of all abdominal sections in these cases was 9.3 %, or that of the entire series. In 4 cases section was made through the vagina under a mistaken diagnosis. Five cases were possibly operated upon too late, and there were 2 cases in which the tumor increased after admission to the hospital, but which recovered without operation. In 4 cases there were attacks of pain without increase in the tumor, and in 2 cases the hematocele was discharged through the rectum. Champneys calls attention to the fact

that rise of temperature does not necessarily indicate infection of the sac. He does not have resort to mere puncture. When opening such a tumor through the vagina, he cuts through the vaginal wall, stopping any bleeding before proceeding further and opening the cyst with the fingers, aided with some blunt instrument. After washing out the sac he is accustomed to drain with gauze. In summarizing these cases Champneys calls attention to the fact that 60 % of the whole number recover without abdominal section.

Strassmann¹ prefers operation per vaginam whenever possible, as less likely to cause future sterility. Scanzoni gives a table from the Leipsic Hospital, showing that after laparotomy 17 % conceived, and after operation per vaginam without removal of the gestation-sac 55 % conceived. Strassmann would use the vaginal procedure in an intact, unruptured tubal gestation in the early months, operating by expression or evacuation of the tube; but would hold it advisable to remove the tube in case of rupture and severe hemorrhage. For this method the size of the tumor to be removed should not be more than that of the third, or, at most, the fourth month. Laparotomy may be justified if the diagnosis is uncertain, or in case of peritoneal perforation, in appendicitis, etc., or in case of life-threatening hemorrhage. But it should be considered the exceptional procedure. The removal of a tubal pregnancy at the end or middle of the term can generally be avoided, and at an earlier period the vaginal method is preferable, as more certain and less dangerous. Strassmann gives the history of 9 cases thus treated, with illustrations.

LABOR AND THE PUERPERIUM.

Chloroform in Labor.—An editorial in "Medicine"² remarks that notwithstanding all that has been written upon the subject, it is believed that chloroform is oftener omitted than given in normal labors. The reaction to pain is so different that no definite rule can be laid down that is applicable to all cases. The safety of chloroform is now conceded. There are few obstetric operations in which a general anesthetic is not employed, and most obstetricians prefer chloroform. The painless labor is the exception. The time to employ chloroform is at the end of the second stage, at which time it will tend to preserve the perineum, and will do much to lessen some of the dangers incident to parturition. The teaching of De Laskie Miller on this subject deserves a wider recognition and acceptance by the profession than has been accorded it. It may have been published, but if so we have never seen it, and certainly little harm can result from a repetition of a method at the same time safe and valuable. For years he instructed his classes to use chloroform in the second stage of labor after the following plan: An ordinary glass tumbler is taken, in the bottom of which is placed some gauze or a linen handkerchief. Upon this a few drops of chloroform are poured. This the patient holds over the mouth and nose. The shape of the container is such that as soon as the slightest muscular relaxation takes place

¹ Berl. klin. Woch., Nos. 24, 25, and 26, 1902.

² June, 1903.

it falls from the patient's face. In this way the danger of an overdose is avoided, as the chloroform-vapor being heavy, as soon as the container is away from the mouth and nose no more is inhaled. This method of giving chloroform is safe and practical, permitting the accoucheur to devote all of his attention to the labor, and at the same time the administration of chloroform is not entrusted to untrained hands.

Lepage and Le Lorier¹ employ ethyl chlorid as a general anesthetic during parturition when the pain is not sufficiently severe to warrant the use of ether or chloroform, but the patient desires to avoid suffering. Under these circumstances ethyl chlorid presents many advantages: (1) It is easily administered, the doses being always the same. (2) Anesthesia is obtained in from 30 to 60 seconds, and lasts for about 4 minutes without renewal. (3) The return to consciousness occurs very rapidly without headache, and is accompanied only occasionally by slight vomiting. Inhalations of ethyl chlorid may be employed with advantage under the following conditions: (1) In the course of labor, when it is urgent to extract the fetus with forceps, when an internal version is practised, or when the anterior foot is pulled down in incomplete presentation of the buttocks. In the latter case anesthesia by ethyl chlorid has the advantage of allowing the patient to awake rapidly and to complete the expulsion of the fetus by her own efforts. (2) During delivery ethyl chlorid may be used when the accoucheur is obliged to remove the placenta from the uterine cavity, or exceptionally to extract the membranes when the greater part of them remain in the uterus and it is necessary to remove them. (3) After delivery it may be used when the insertion of several sutures into the perineum is required. During pregnancy ethyl chlorid may be used as a means of diagnosing pelvic deformities.

The Rational Conduct of the Third Stage of Labor.—Rudolph Wieser Holmes² details the third stage of labor from its anatomic, physiologic, and clinical standpoints. He is in perfect accord with those who declare that a proper conduct of the third stage will give a minimum amount of aberrancies, but he declares he can prevent the evil consequences of atony of the uterus from faulty innervation or maldevelopment of that organ, from pathologic distention of the pregnant uterus, the enervating influences of "society," unhygienic surroundings, partial or complete retention of the secundines, etc. Methods of delivering the placenta as suggested by Credé, Kabierske, Dohrn and Ahlfeld are detailed. Holmes holds one hand on the uterus until completion of second stage of labor; and when the placenta passes from upper to lower segment, which may be within 10 minutes to 2 hours, at the height of contraction the uterus is grasped anteroposteriorly, brought to the middle line, if necessary, raised perpendicular to the brim, and then compressed and depressed. All lacerations are sutured at the termination of this stage.

The Importance of a More Careful Examination and Treatment of Women after Childbirth.—B. C. Hirst³ states that the medical

¹ Amer. Med., Feb. 14, 1903.

² Amer. Med., Aug. 23, 1902.

³ Amer. Med., Nov. 29, 1902.

profession is responsible for five-sixths of the diseases of women as they are met to-day. Most of those consequent upon childbirth can be prevented or cured before they can affect the individual health. Every woman should be subjected to three examinations after labor: the first, within 48 hours, to detect injuries to the parturient tract; the second, before she leaves her room, to determine the position of the uterus; the third, at the end of 6 weeks, to observe the condition of all the pelvic structures and organs, the abdominal walls, the coccyx, and the position of the kidney. A woman should be left in as good condition after childbirth as before. In the Maternity Department of the University of Pennsylvania the ordinary injuries due to lacerations are repaired after the first examination (within 48 hours). All injuries to the cervix without exception have been repaired in the University Maternity for several years past. Hirst finds that 48 hours should elapse after labor before closing lacerations of the cervix. A successful result can then be obtained whatever their extent or number, unilateral, bilateral, or multiple. If there is a reason against early operation, *e. g.*, infection, the operation should be performed before or at the completion of the puerperium. He also pays attention to Waldeyer's triangle or urogenital trigonum, believing that unattended injuries have led to cystocele. In conclusion, he states that if all classes of society could secure the same good treatment which the poorest are receiving in the modern maternity hospital an advance will be made which will rank with vaccination, anesthesia, and asepsis.

Laceration of the Vagina during Labor.—Kaufman¹ contributes an extensive paper in which he has collected 82 cases of this complication of labor. But only a portion of these were available for statistical study, as many of them were imperfectly reported. Most of them occurred when the fetus presented by the vertex, next in frequency in transverse positions, and least often in breech presentations. In 78 cases, 49 happened in spontaneous labor. In 29 some violent effort at extraction had been made. The condition of the pelvis was reported in 58 of these cases. In 38 the pelvis was said to be normal and in 20 to have been contracted. In 3 cases myoma of the uterus was present as a complication, and in 1 case a divided uterus, and in 1 scars were found in the vagina and adjacent tissue. Almost all of the patients were multiparas, as the accident happens very rarely in primiparous patients. In a few of these cases the children were of excessive size, although in most they were of ordinary development. In 68 cases the abdominal cavity was opened through the peritoneal sac. In 14 of these the intestine prolapsed, and in 1 case an ovary and tube. In 29 of these cases the child made its way out of the uterus, in 26 into the abdominal cavity, and in 3 into the subperitoneal tissue. The placenta was found in 30 cases outside the uterus, in 27 cases in the abdominal cavity, and in 3 cases in the tissue beneath the peritoneum. As regards the method of delivery most likely to result in injury to the vagina, it was found that version and extraction was especially dangerous, next the forceps, next extraction only, while craniotomy was more apt to produce the accident than even-

¹ Arch. f. Gynäk., Bd. lxxviii, Heft 1, 1903.

tration or decapitation. Of these patients, 3 died undelivered. The treatment of the complication may be divided into those cases in which abdominal section, with or without extirpation of the uterus, was practised, and those cases in which the accident was treated by suture or tampon applied through the vagina. Treatment was selected in accordance with the extent of the laceration and the involvement of the uterus. When the uterus was uninjured and the laceration could be reached from the vulva, it was closed by suture; and if the uterus was uninjured and the laceration could not well be reached, tampon and drainage with gauze was the method employed. The mortality was 35 % in cases in which both the uterus and vagina were injured, the most frequent cause of death being septic infection, and next in order hemorrhage. In cases in which the vagina only was injured the mortality was 25 %. In these cases the mortality from bleeding was but 5 %, septic infection playing the more important part. The symptoms of this accident depend entirely upon the extent of the laceration. A small rupture of the vagina during labor may give rise to no symptom, and may not be discovered until an examination is made after the birth of the child. Some have laid stress upon the contraction of the round ligaments and upon the suffering and anxiety of the patient. Uterine contractions are not always excessive in these cases, and the patient may not complain of excessive suffering. The mortality from hemorrhage is considerable, and depends upon the extension of the laceration into the connective tissue about the uterus. In diagnosing the condition, examination by the introduction of the entire hand is necessary to accurately localize the injury. So far as the prognosis is concerned, the mortality of rupture of the uterus as variously stated at present is from 60 % to 73 %. The mortality of rupture of the vagina is much less, and may be reckoned at 25 %, as has been stated, in favorable and uncomplicated cases. The prognosis for the children is exceedingly bad in cases of vaginal rupture. The placenta is almost invariably prematurely separated in these cases, and as a consequence the fetus rapidly perishes. The prognosis for the child is so bad that its interests must not be considered in selecting a method of treatment. In the treatment of these cases, if laceration happens before the termination of labor, the patient must be delivered as rapidly as possible, no attention being paid to the life of the child; hence, craniotomy or any other method of delivery which will subject the mother to the least violence should be chosen. Perforation of the after-coming head should be employed if the slightest difficulty arises in its delivery. Usually the forceps can be employed to advantage when the head is presenting.

Ligation of the Umbilical Cord.—V. A. Petroff¹ describes the following method of treating the umbilical cord, which has given him excellent results. This method was originally devised by Kousmine, but it was applied to a very large number of newly born children during a period of 4 years by the author. Instead of using the ordinary ligature, Kousmine suggested the application of a rubber ring to the umbilical cord by means of an instrument which he devised specially for this

¹ Roussky Vrach, Sept. 7, 1902.

purpose. The rings used are made of the best quality of gray rubber, with a diameter of from 0.9 cm. to 1 cm., a thickness of 0.2 cm. to 0.3 cm., and a diameter of the lumen of about 0.3 cm. The instrument is constructed in the form of a forceps with hollowed or deeply grooved blades, in the middle of which is a raised portion for the compression of the umbilical cord. The ring is placed on the forceps before the labor, and the whole is immersed into a 2 % boric acid solution, whence it is removed when needed. The cord is compressed about 0.5 cm. from the body by means of the forceps, and the navel-string is cut just above the forceps. The ring is then moved down from the forceps upon the cord, and the forceps is removed. The ring usually remains just at the skin edge of the cord or a few millimeters above this point. The stump is now shortened to 1 cm., and, after the bath, covered with cotton, which wraps the ring and partly separates the ring from contact with the skin. Next comes a compress of squares of gauze, over which is powdered a little dried gypsum, and over that another layer of squares of gauze and a bandage. In from 10 to 12 hours the stump so treated dries and becomes mummified to the consistency of cartilage. At the end of 24 hours the rubber ring begins to sink into the depression of the navel, thus leaving no part of the umbilicus uncovered, as in the



Fig. 64.—Duke's umbilical clamp
(Brit. Med. Jour., March 14, 1903).

usual method of treatment. The children were bathed every day, and in no case out of a series of children numbering 400 was there any absorption of septic material into the navel. A. Duke¹ recommends a simple form of clamp (Fig. 64) which he considers will be found in practice a great improvement on the old system. When the infant has been washed, the stump of the funis is passed through the hole in the flat plate of the clamp, which is then placed close to the abdomen, while the spring portion is uplifted by pressure of finger and thumb; the spring is then released and holds the cord firmly. Anything protruding beyond the clamp is cut off with scissors, and the binder and dress put on. The clamp need not be interfered with, dropping off in the usual time with its contents. The small portion of dead tissue it holds can be removed, the clamp dropped into boiling water, and when dry is fit for use when next required. The simplicity and cleanliness of the clamp should give it preference over the old plan of dressing. The fact of having no dead or dying stump of funis in contact for several days with the infant's abdomen is a considerable advantage, the scorched rag being anything but reliable in keeping the funis and abdomen from contact.

Baths during the Puerperium.—[Baths are usually regarded in the present obstetric teaching as contraindicated during the puerperium, except for cases of septicemia in which cold hydrotherapy and cases of postpartum hemorrhage in which hot hydrotherapy fulfil respectively the usual indications for hyperthermia and shock. Except these unusual

¹ Brit. Med. Jour., March 14, 1903.

conditions, most accoucheurs do not allow baths until after the puerperium is over and the woman again on her feet.] G. Martin,¹ however, after a careful study of the subject, offers the following indications of the bath for the puerperal woman. By their sedative action tepid baths at from 32° to 35° C. are of value to quiet the nervous system whenever it has been affected; for example, as is shown by cramps, urinary retention, mental excitement, and the like. By their diaphoretic and diuretic influence they will be found to meet the usual calls of both these functions. Distended and painful breasts will go down at once or after a few hours through the action of warm baths lasting from 20 to 25 minutes. Errors in the involution of the uterus, lymphangitis of the breasts, galactophoritis, and other inflammatory conditions are all benefited. There are, of course, absolute contraindications of body-baths during the puerperium which are summed up in the dangers of infection from any possible source; of such, lesions of the external genitals, ulcers of the leg, abscesses, ulcerating gummas, and the like, are familiar and emphatic examples.

MATERNAL DYSTOCIA.

Puerperal Eclampsia; Pathogenesis.—Blumreich² has previously made a series of investigations to determine whether increased sensibility is characteristic of the nervous system during pregnancy. His experiments were conducted by injecting kreatin into the brain of pregnant animals after trephining, and in the second group of cases by injecting a solution of kreatin into the blood-current through the carotid artery. His results demonstrated the fact that in pregnant animals a condition of increased sensibility to reflex irritation is found in the nervous system. This is corroborated by clinical observation, which shows that eclampsia, tetanus, and chorea are found with special frequency in pregnant patients. In order to determine as nearly as possible the source of the irritating material causing eclampsia, Blumreich experimented upon pregnant and nonpregnant animals, by causing complete retention of urinary excreta by extirpating both kidneys. This operation is performed without much difficulty by placing the animal upon the abdomen, and, under anesthesia, making an incision along the back at the eleventh vertebra, in such a position that both kidneys can be readily removed through one incision. The first animal operated upon died from peritonitis through an accident which opened the peritoneal cavity; the others showed no evidence of infection. Ten pregnant animals and 12 nonpregnant were operated upon. In most of the cases rabbits were used. There was no immediate effect following the operation. The animals moved about freely and ate with appetite. The first evidence of disease was increased irritability, so that the skin could not be touched or stroked without causing great uneasiness. Convulsions in groups of muscles then followed, with drawing of the head backward and toward the right side. In some cases clonic convulsions occurred. This gradually extended until most of the

¹ La Sem. Méd., 1902, No. 23.

² Arch. f. Gynäk., 1902, Bd. xlv, Heft 2.

muscles of the body were involved. They resembled those which followed the injection of a solution of kreatin into the carotid artery. The nervous system showed not only increased excitability, but very soon in the progress of the case an anesthetic effect was noticed. The animals not only ran about eagerly, but at times lay quietly, as if anesthetized. In nonpregnant animals convulsions began, on the average, 71 hours after the operation. Death occurred, on the average, 79 hours after the operation. In pregnant animals convulsions occurred in 63.4 hours after operation, and death followed the operation, on the average, in 70.8 hours. The shortest period in which convulsions occurred after operation was 40 hours; the longest, 104 hours. Further experiment was made by feeding with the same food two groups of animals—one pregnant, the other nonpregnant—operated upon, when it was found that the difference in the frequency and prompt occurrence of the convulsions between pregnant and nonpregnant animals is very much lessened. The conclusions drawn from these experiments strengthen our belief that the brain of the pregnant animal is more sensitive to irritation than that of the nonpregnant. The substances which produce convulsions exist essentially in the nonpregnant as well as in the pregnant. [One fact stands out very clearly from these and other experiments upon this subject; eclampsia is not the result of uremia. While lesions in the kidney may assist in producing eclampsia, these lesions are the result of the circulation of poisons which in themselves cause eclampsia. Experiments show that animals, whether herbivorous or carnivorous, generate poisons in the body during pregnancy. To isolate poisons which produce eclampsia it will be necessary to isolate from the blood, the central nervous system, or the urine, substances which are capable of exciting irritation in the nervous system during pregnancy.]

Müller¹ concludes that eclampsia is the result of a general and systemic poison. The place of origin for this poison he believes to be the interior of the genital tract, and especially the interior of the uterus. Reasoning by analogy, he concludes that the same or analogous causes which produce fever during pregnancy and labor produce eclampsia also. He bases his decision upon a careful comparison of those complications of pregnancy and labor resulting in fever with the conditions which precede eclampsia. He finds that, so far as the fetus is concerned, both fever and eclampsia greatly jeopardize its life. He draws a close parallel between all of the circumstances attending fever in pregnancy and labor and those which result in eclampsia. He believes that necrosis of the decidua, with the presence and activity of bacteria, produce eclampsia. He calls attention to the fact that eclampsia is most frequent as the intrauterine tension increases through the progressive growth of the ovum. His suggestions for treatment are to empty the uterus promptly, taking special care to remove the decidua and all portions of placenta and membranes. So far as the prophylaxis of eclampsia is concerned, nothing can be done except to keep the patient as clean as possible. [This paper is chiefly valuable for the excellent review which it contains

¹ Arch. f. Gynäk., 1902, Bd. lxxvii, H. 2.

of the literature of the subject. It is hard to reconcile the writer's theory with facts observed through clinical observation. If the interior of the uterus is the source of the poison-producing eclampsia, why should a restricted diet diminish the danger of eclampsia? If the only available treatment is the complete emptying of the uterus, why is it that many patients do best when the uterus is not emptied until nature gradually accomplishes this, while the patient is made to eliminate freely by packs, baths, and other means? We are quite agreed with the writer that eclampsia is the result of systemic poison, but we must have further evidence before we can accept his statement that the genital tract is the source of the poison.]

According to E. T. Abrams,¹ the relation of the thyroid to eclampsia is very interesting. An enlargement of this gland takes place in primiparas about the sixth month, and in multiparas about the fifth. The function of the thyroid is to regulate metabolism. Lange has demonstrated that the enlargement is physical, or rather physiologic. In 20 out of 25 cases of pregnancy, in which enlargement of the gland did not take place, albuminuria and convulsions did develop. Herzfeld holds that pressure on the ureters is an etiologic factor in the causation of the disease. In his 81 fatal cases all showed pathologic changes in the uropoietic tract. [The effort to prove that eclampsia is identical with uremia has gone down as "not proved." However, it is the incomplete urea in the blood that (in the form of toxins) doubtless causes the convulsions. Therefore the diminution of the urea in the urine ought to be to us an indication that the toxins are being retained. The urinary tract must not alone be watched, but the other organs should receive their quota of our attention. Jaundice is always a very grave symptom. It is a good rule to consider every pregnant woman constipated until otherwise proved by a competent nurse. The experiments of Tarnier, Ludwig, and Savor certainly show that the toxicity of the blood-serum is increased in eclampsia, while, on the other hand, those of Charrin and Volhard seem to prove just as conclusively that it is not.]

Constipation as a Factor in Eclampsia.—According to John Ashell,² no one will doubt the close relation between renal and intestinal diseases, not those intestinal diseases in which there is structural change, organic diseases, but in which there are chemical changes occasioned by malassimilation or a disturbance of digestion by miscellaneous indigestible articles of foodstuffs; again, in adults whose sole complaint is constipation the gradual appearance of albumin is noticed if the intestinal chemical changes are not rectified. How this condition is brought about is not yet explained. Whether it is due to disturbed metabolism, toxemia, or destructive cell-masses that are carried from the intestine by the blood and deposited in the liver, producing areas of necrosis and further finding their way to the kidneys, producing a destruction of the parenchyma, is more than we can at present explain. Certain it is that pregnant women are capricious in their appetites and indulge in foodstuffs that they would never crave were they not pregnant. The

¹ Am. Jour. Obstet., Jan., 1903.

² Am. Jour. Obstet., April, 1903.

majority of the author's cases occurred in winter, when the skin was inactive and the waste-products of metabolism were not excreted because of the dermal inactivity. During January and the early part of February of 1902 in the New York Foundling Hospital, the examination of the urine of the women in the waiting wards showed in about five-sixths of the number the presence of albumin, ranging between a very faint trace and an abundant quantity, with a lowered specific gravity; in some cases running as low as 1.004 and 1.000 and occasionally 1.001. There were from 30 to 40 women in waiting and practically all were primigravidae. In addition to the presence of albumin, one-fourth showed signs of toxic symptoms; headache, nausea and vomiting, edema of the legs, and increased arterial tension. There was no striking reason why five-sixths of the waiting women should have albumin and so many others show toxic symptoms. The ordinary routine for each patient—diet, baths, exercise, recreation, clothing—apparently existed as in previous months. The presence of constipation, however, was well marked, but whether the women were more unfortunate in this regard than the preceding inmates could not be said. Several of these patients were taken with eclampsia and were treated by catharsis alone, and the greater proportion recovered without any alarming symptoms. In fact, only one death was recorded, and this was due to a sudden heart-collapse.

Treatment of Puerperal Eclampsia.—Ahlfeld¹ employs the hot pack systematically in pregnant women who present edema, albuminuria, or other threatening signs of eclampsia, in order to relieve the kidneys by stimulating the other emunctories of the body. The patient is stripped and wrapped in a sheet which has been dipped in hot water and wrung out; a dry blanket is then wrapped over the sheet, care being taken that the arms are not exposed; another cover is placed over the patient and she is allowed to remain thus for about 3 hours, during which time she may be given plenty of water or milk to drink. This procedure is repeated twice a day. Of 36 patients thus treated, 23 of whom were primiparas, not one had an eclamptic seizure. One patient, who in two previous pregnancies had presented albuminuric retinitis, was enabled to go through her third pregnancy without any return of the trouble by the use of the hot pack daily for 7 weeks. The usual medicinal treatment of these cases should be continued at the same time. According to J. Veit,² when the cervix is fully dilated, the indication is for immediate delivery; if it is partially so, mechanical dilation should be practised. When the cervix is closed, expectant treatment is usually the best. Of the remedies recommended to lessen the convulsions, morphin is the most important, but it cannot be regarded as in any way curative. The most that can be said for it is that it lessens the severity of the attacks. Chloral is also useful. Potassium bromid, veratrum viride, and amyl nitrite have not given brilliant results. Bleeding with injection of salt solution and also sweating are probably of use. Veit does not believe either cesarean section or forcible delivery

¹ Bull. Gén. de Thérap., vol. cxliii, No. 14, 1902, p. 554.

² Therap. Monats., April, 1902, xvi, 169.

justifiable in uncomplicated eclampsia. When, however, the convulsions are growing more severe and labor does not progress, the latter method should be adopted; or in the eclampsia of pregnancy when the narcotics have failed section is indicated.

Herman¹ disagrees with those who contend that emptying the uterus is an almost certain means of arresting eclamptic convulsions. Schauta quotes from the records of the lying-in clinic of Vienna 342 cases of eclampsia, in 185 of which the fits began during labor. In only 62 of these did they cease on delivery, while they continued in 123, in 50 with increased violence. Brummerstadt gives a record of 63 cases, in 18 of which the fits ceased on delivery, in 17 became less severe, and continued unaltered in 28. Herman cites the figures of Dührssen, Olshausen, and others showing similar results, and then reports from his own experience 2 cases of eclamptic fits with a temperature of about 105°. In the treatment the use of tepid baths reduced the temperature and resulted in the abatement and early cessation of the convulsions and final recovery of the patients. [Although chloral hydrate is generally considered as the best medicinal treatment of eclampsia, it is nevertheless a fact that this remedy is only occasionally used in a rational manner and in sufficient doses. Most practitioners administer the drug by rectum.] According to the experience of Commandeur² (Lyons), this method is defective because the rectal mucosa does not always absorb the drug. A certain number of patients do not retain an injection containing it, but reject it more or less without the perception of the attendant. The remainder of the patients do not fail to show a rectal intolerance of such a degree that it is often impossible to administer more than 5 or 6 enemas containing it. For this reason this authority prefers giving this remedy by the mouth, observing, however, two important precepts, formulated originally by Foucher. Before administering the drug, the stomach should be washed out to quiet the irritability of it. Then the medicine must be dissolved in a large quantity of water, namely, 100 to 150 drams to every dram of chloral. Given in this manner it is well tolerated, fully absorbed, and may be given in large doses for some time. Commandeur has been able to give 14 grams (3½ drams) within 40 hours. In 4 cases in which he has tried this method of administering the drug he has seen the pregnancy follow its course to the end in a manner which might be described as entirely exceptional.

At a meeting of the Obstetrical Society of Philadelphia the subject of eclampsia was fully discussed. Referring to the use of normal saline solutions, R. C. Norris³ said: "I would like to give a word of warning as to the use of salt solution. I have found in some cases that an excessive amount of salt solution has aggravated the condition of the kidneys, has produced edema of the lungs, and helped to do the very thing which we aimed to avoid. I should place as a limit one quart of salt solution and no more until free diaphoreses, diuresis, or catharsis has occurred. When there is some edema of the lungs it should not be employed at

¹ *Canad. Pract. and Rev.*, Aug., 1902.

² *La Sem. Méd.*, Oct. 1, 1902.

³ *Canad. Pract. and Rev.*, Jan., 1903.

all. I have seen edema of the lungs aggravated and the patient's serum run out of her mouth as the result of too free use of salt solution. Large amounts of salt solution are of the greatest value when profuse catharsis from saline purgation has occurred."

Venesection in Eclampsia.—An editorial in "American Medicine"¹ says that venesection is so rarely practised to-day in general medicine that a prominent therapist has observed that very many of the profession have never abstracted blood for therapeutic purposes, nor have ever seen it done by some one else; and yet bleeding is a measure undoubtedly of the greatest value in many conditions. The indications for venesection are as clear and well defined as are the indications for any other remedy. In no condition is it more positively indicated than in certain cases of eclampsia. In this condition the reaction against the indiscriminate use of the lancet has undoubtedly gone too far. Our medical forefathers were wrong in making venesection the common routine treatment in eclampsia, but we are equally wrong in entirely rejecting it. It is of great value in selected cases and often rescues the patient from the impending danger of pulmonary edema and apoplexy. When the physician has to deal with a strong, full-blooded patient with high arterial tension, the abstraction of from 20 to 35 ounces of blood is recommended. In the report of 15 cases, cited by Hirst, in which bleeding seems to have been the only thing done there was only 1 death. By this procedure a large amount of noxious principles in the system may be directly eliminated, and, according to Peter, it further removes from the convulsive centers the poisonous blood by restoring contraction of the small vessels. Although Winkël, Martin, and others have condemned the practice, yet undoubtedly in strong plethoric women with great cyanosis it has favorable results. In all cases after venesection it is wise to dilute the toxin of the blood by the employment of hypodermoclysis. This is, we think, preferable to direct venous transfusion, as the liquid is slowly absorbed and does not overtax the kidneys. We have recently observed successful results from this treatment and believe that the profession generally recognizes that it rests upon a sound clinical basis.

Thyroid and Parathyroid Insufficiency in the Pathogeny of Puerperal Eclampsia.—[We appear to be admitting of late years an ever-growing list of possible causes of puerperal convulsions. The theory of renal disease as the chief, if not the only cause, long ago ceased to receive general acceptance. Within recent years it has been to a great extent supplanted by the doctrine of an hepatic pathogeny. Still more recently the idea that insufficiency of the thyroid gland or of the parathyroid bodies was at the bottom of the trouble in many cases has been urging itself upon a number of excellent observers, notable among whom are A. Fruhinsholz and P. Jeandelize,² who contributed a highly suggestive article on the subject. They set out with the assumption—surely not a forced one—that puerperal eclampsia is due to poisoning by some material that may either be generated in the system or be taken in

¹ September 27, 1902.

² Presse Méd., Oct. 25, 1902.

from without, and that the injurious action of this material is owing to defective functional activity on the part of the eliminating organs or of those organs whose office it is to destroy or transform such products; and they set forth a strong argument in favor of including the thyroid and the parathyroids among the latter. About 3 years ago Lange¹ reported the results of his observations upon the relations between pregnancy and the thyroid gland, and our authors cite the drift of his article as follows: Of 133 women examined during the last 12 weeks of pregnancy, 108 showed thyroid hypertrophy, in 3 instances its existence was doubtful, and in 22 cases it was manifestly absent. Of the 22 women who had no thyroid hypertrophy, 20 were albuminuric, and 16 of the 20 had not only albumin in the urine, but casts also. On the other hand, of the 108 women who had this physiologic thyroid hypertrophy, only 2 were albuminuric, and both of them had had nephritis before the pregnancy occurred. The frequency with which this hypertrophy of the thyroid takes place during pregnancy may be inferred from the fact that Lange's observations were made in Königsberg, in a country where goiter is exceptional. In primiparas it generally did not show itself until the sixth month, but in multiparas it began in the fifth month. Lange subjected 10 pregnant women with the hypertrophy to medication with small doses of the active principle of the thyroid gland, and found that the enlargement disappeared in from 11 to 14 days, but generally recurred after the medication was suspended. These facts, together with others of like purport which they cite, have convinced the authors that in certain cases of eclampsia there is a relation of cause and effect between thyroid insufficiency and the convulsions, but they question if it is really the thyroid itself that is at fault. It appears from the observations of Moussu, of Vassale and Generali, of Lusena, and of Gley, that thyroid insufficiency gives rise to chronic disturbances, such as myxedema, whereas parathyroid insufficiency occasions acute troubles, such as convulsions. But the thyroid and the parathyroids, although differing embryologically and histologically, are associated in function, so that apparently thyroid medication suffices to remedy troubles due to parathyroid insufficiency. This being the case, it certainly seems feasible to subject women threatened with puerperal convulsions to a test of the question by means of such medication, and it seems well also to be on the lookout for the physiologic thyroid hypertrophy with which Lange has met so frequently.

Many of the symptoms which patients develop under thyroid treatment are probably due to profound circulatory changes produced by the drug, says H. Oliphant Nicholson.² It is a well-established fact that the thyroid gland is enlarged in normal pregnancy. In eclamptics the normal enlargement of the gland is said to be absent. It is well known that under the action of iodothylin the metabolic processes of the body are greatly stimulated and there is a striking increase of the secretion of urea. In eclampsia and in all conditions of hypothyroidism the quan-

¹ Zeits. f. Geburts. u. Gynäk.

² Jour. Obstet. and Gynec. for Brit. Emp., July, 1902

tity of urea is greatly diminished. The symptoms of a typical attack of puerperal eclampsia closely resemble those of complete experimental athyroidia. When a pregnant woman who exhibits eclamptic symptoms is put to bed and kept on a milk diet, the demands made on her thyroid secretion are greatly lessened, and the process of nitrogenous metabolism is again efficiently carried out. The thyroid gland may under normal conditions participate in controlling renal function as follows: (1) The iodothyron may exert some specific action upon the kidney; (2) urea—the final product of nitrogenous metabolism when efficiently carried out in the presence of an adequate supply of iodothyron acts as a powerful diuretic; and (3) the well-known changes produced upon the circulation (vasodilation) by iodothyron tend to promote and maintain renal activity. It is thus evident that the real significance of the pre-eclamptic is the break-down of the defensive mechanism, the result of some inadequacy of the thyroid and parathyroid glands, whereby the process of nitrogenous metabolism, instead of resulting in the formation of urea, ceases with the production of intermediate substances, which, when absorbed, excite the symptoms of toxemia. A large dose of morphin is a valuable adjunct in thyroid treatment, because it gives the thyroid gland time to recover itself by inhibiting metabolism and removing the arterial spasm.

Operative Treatment of Puerperal Eclampsia.—An interesting new suggestion has been advanced by G. M. Edebohl,¹ namely, **renal decapsulation** for the cure of eclampsia of puerperal origin. He believes that renal decapsulation for puerperal eclampsia of renal origin is the logical outcome of the encouraging results following his operation in cases of chronic Bright's disease. He has successfully performed bilateral renal decapsulation for puerperal eclampsia upon a primipara 2 days after forced delivery. The convulsions began before labor and continued to the time of operation, the patient indeed having a convulsion while under chloroform on the operating table. This operation, performed on February 17, 1903, was believed to represent the first instance of renal decapsulation, or, for that matter, of any operation upon the kidney or kidneys, ever undertaken for the cure of puerperal convulsions. [The favorable results, immediate and remote, in this case, full details of which are given in this paper, at once assign a place to renal decapsulation as one of the resources at our command in the treatment of puerperal eclampsia. A woman suffering from uremic convulsions is entitled to the positive benefits of decapsulation whether pregnant, in labor, or in the puerperium. In those cases of eclampsia which appear just at the beginning of childbirth two possible methods of treatment claim attention; namely, intrauterine kolpeuryxis and cesarean section. Without doubt the former is, for the average practising physician, the easier; but one cannot overlook the fact that forcible dilation of the mouth of the womb has an unfavorable influence upon cases of eclampsia. Whether tropacocain (Winckler) is to prove in this connection a new means of overcoming the difficulty is still to be proved. On the other hand, however, the ordinary cases of eclampsia are in our hospitals and clinics most suc-

¹ N. Y. Med. Jour., June 6, 1903.

cessfully treated by cesarean section, because the uterus is so quickly emptied by it, and the other dangers of this disease thus stopped.] Jalireiss¹ (Augsburg) reports 2 cases of eclampsia in which he emptied the uterus by the vaginal cesarean section, as originally suggested by Dührssen, in the first case with favorable, and in the second case with unfavorable results.

Contracted Pelvis.—Hugo Ehrenfest² has devised a method of determining the internal dimensions, configuration, and inclination of the female pelvis. He demonstrated 2 instruments constructed by Julius Neumann and himself, called pelvigraph and kliseometer. The construction of the first-mentioned instrument is based on the following principle: If a straight rigid rod is so moved within a plane that in all points of its course it is kept parallel to its first arbitrarily chosen position, and at the same time one of its ends is permanently kept in touch with a given line, then necessarily its other end will create, if approximately equipped with a marker, an exact duplicate of said line. In this way it is possible to produce in a comparatively easy manner, by means of the pelvigraph, an exact picture of a median vertical section through the pelvic canal in the living, or to measure the distance between any two points within the pelvic cavity. The writer explains the manipulation of the instrument on a skeleton pelvis, and demonstrates a number of such diagrams taken from different patients with pelvic deformities. These diagrams show the character of the deformity, and give all the conjugates in actual size. Their value for scientific and especially for teaching purposes is obvious. The second instrument, called the *kliseometer*, is very simple in its construction. The author claims that it is destined to directly measure the inclination of the external conjugate. The combined use of both instruments permits of determination of the inclination of the true conjugate in the living, a problem that as yet has been unsolved. By means of the *kliseometer*, the inclination of the conjugate at the obstetric outlet is measured. The angle found is with a protractor transferred upon the diagram of the pelvis, and in this way an angle is constructed, representing the real inclination of the pelvis. If these pictures be so held that the chosen line parallels the horizon, a very instructive conception is gained as regards the position the pelvis had in the upright women. These two instruments offer the possibility of graphically reproducing the form and exact dimensions of the most important sections through the pelvis, and of permitting measurement of its real inclination.

Treatment of Contracted Pelvis.—Kroenig³ discusses the treatment of labor complicated by contracted pelvis, and bases his arguments on the material at the Leipzig Maternity clinic. He finds that one practises 5 methods for this condition, and he deals with each of these separately. Before doing so, he says that it is impossible to make hard-and-fast rules for each degree of flattened or generally contracted pelvis, since the size of the fetal head, the strength of the labor pains, and, above all, the impossibility of directly measuring the conjugata vera must upset any such

¹ Zent. f. Gyn., 1902, No. 35.

² Med. News, March 28, 1903.

³ Münch. med. Woch., Aug. 12, 1902.

rule. First he turns to *version*, and says that in the cases in which the after-coming head may be supposed to pass through the contracted inlet of the pelvis, one can never be sure whether it will not come through in the position of a vertex presentation, if one will wait; version must be performed either before the membranes have ruptured or immediately after, and at this time one has no means of estimating how much good pains and molding may do. He has compared the results obtained in clinics where version was largely practised with those where this means was not used, and finds that the prognosis for the child is not improved. Next comes the *high forceps-operation*, and of this, he says, gynecologists are mostly agreed that one should not apply forceps with the intention of attempting to overcome the disproportion between the pelvis and fetal head. A forced delivery by this means is not safe for the mother, and almost certainly will sacrifice the life of the child. The third means of dealing with this condition is the *induction of premature labor*. The same difficulty must be raised against this proceeding as against version, that one does not know if one cannot obtain a living child by waiting, and he considers that the chances for the child are incomparably better if the fetus is allowed to come to full time. He therefore also puts this method on one side. The remaining two methods are *symphyseotomy* and *cesarean section*. When the conjugata vera is not less than 3½ inches, these two operations may be considered as rival methods. Against the former it must be remembered that after it has been performed the labor will not be completed at once, that it is a very difficult operation and requires a skilled surgeon and obstetrician. Once performed, however, the future labors of the patient are not infrequently rendered more easy. Cesarean section is much more easily performed, and the child is delivered at once. But these procedures still have a mortality of about 2%, and this risk for the mother must be considered. He thinks that the best way is to wait to see if the head will pass through the inlet of the pelvis, and if it does so, the labor may be completed with forceps; if the mother's life becomes endangered during the waiting, one always perforates the fetal head, which one may do to save the mother's life, and if the two are in no immediate danger, then one should consider symphyseotomy and the abdominal operation.

On the Treatment of Uterine Rupture, with Statistics of 77 Cases.

—Draghiesco and Cristeanu¹ state that in 21 years (1880-91) there were seen in the Maternity at Bucharest 77 cases of ruptured uterus, with various complications. These occurred in a series of 23,016 accouchements, and 54 recovered and 23 died. The determining causes assigned for the rupture are as follows: pelvic contractions, 34; malpresentations, 22; hydrocephalus, 4; ergot given at home, 4; vaginal cicatrices, 2; malformation of genitals, 2; forceps at home, 2; forceps in the hospital, 2; hand by side of head, 1; unreduced mentoposterior position, 1; placenta prævia, 1; decapitation at home, 1; unknown, 1; total, 77. The seat of rupture is shown in the following table:—

¹ Ann. de Gyn. et d'Obstét., Feb., 1902.

	Cases.	Complete.	Incom- plete.	Re- covered.	Dead.
Rupture of uterus	8	4	4	0	8
“ uterus and vagina	33	23	10	8	25
“ vagina	29	13	16	12	17
“ bladder and vagina	6	2	4	3	3
“ vagina and rectum	1	1	0	0	1
	77	43	34	23	54

In reading this paper one is struck with the extraordinarily large number of cases in proportion to the total number attended, 77 in 23,016, or 1 in 298. Now, Bandl found 1 case in 1200 confinements. Jolly estimated the frequency at from 1 in 1300 to 1 in 5000. Hence we look for the cause of the frequency and find it in the want of proper attendance and the maltreatment which the women had experienced. The majority of the women were received into the Maternity Institute several hours and even days after the rupture had occurred. Most of them had been attended by the gossips of the district (*commères du faubourg*), who, seeing the strong pains and the difficult labor, had practised massage of the abdomen, succussion, and violent traction on that part that presented. It was only in face of the obvious impossibility of completing the delivery or the threatened collapse of the patient, that she was brought to the hospital. [This article appears to us to be chiefly an object-lesson on the possibilities of the practice of midwifery by unskilled hands.] The authors treated 6 cases by tampon, with 5 deaths; 117 by drainage, with 13 deaths; 48 by injections, with 35 deaths; 3 by laparotomy and suture, with 1 death; and 3 by total abdominal hysterectomy, without a death. They argue that for complete rupture abdominal hysterectomy is the only reasonable treatment, and they further argue that for incomplete rupture abdominal panhysterectomy with vaginal drainage is best.

According to C. Sauvage,¹ the frequency of ruptures incomplete to those complete is in the proportion of 1 to 2. The principal sites of rupture are, in the order of frequency: Rupture of a border of the uterus, usually the left intraligamentary, incomplete or complete—ordinarily this rupture is a little in front of or behind the vascular pedicle of the uterus; a transverse or oblique rupture, complete, and sometimes incomplete, of the anterior wall of the uterus; a transverse or oblique rupture, very rarely incomplete, of the posterior wall of the uterus; a rupture involving two segments, uniting at a variable angle. Ruptures in a great majority of cases are located in the inferior segment; very rarely are they prolonged into the body of the uterus or into the vagina. In extracting the fetus, if a diagnosis of rupture has been made, no effort should be made to deliver along the natural channel, unless the head has engaged in the pelvis and there is an absence of dystocia. Laparotomy is indicated in all cases in which the diagnosis of rupture has been made. Amann² has collected statistical information upon the subject, and finds that in cases in which the uterus has been ruptured with wounds of the bladder, out of 15 collected by Klien but 2 recovered. In complete lacerations the closure of the lacerated womb gave a mortality of 53 %. When the child was re-

¹ Thèse de Paris, No. 305, 1902.

² Zent. f. Gynäk., No. 5, 1902.

moved through the vagina and the uterus then closed, the mortality was 47 %. Supravaginal amputation of the ruptured uterus gave a mortality ranging from 42 % to 45 %. The entire removal of the ruptured uterus through the abdomen had been performed 13 times, with 7 deaths. Of late years the vaginal extirpation of the ruptured uterus has been urged as the best method of operation. Of 9 cases collected by the writer, 6 perished, but this mortality must be considered as excessive. Those cases treated without operation, but with drainage by gauze, show a considerable percentage of recovery. In 198 cases of rupture treated without operation 48 % recovered and 52 % died; 42 of these cases were treated by drainage with gauze or with the drainage-tube, and of these 42,

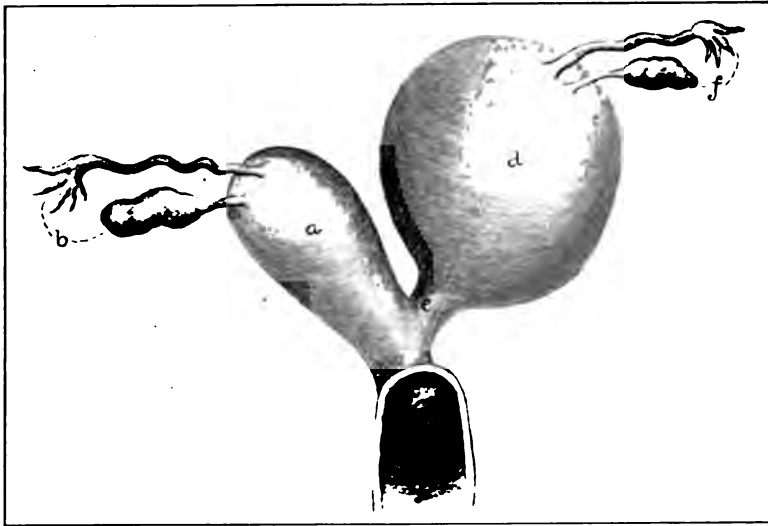


Fig. 65.—Jay's case of pregnancy in a double uterus: *a*, Body of uterus; *b*, right tube and ovary; *c*, cervix; *d*, tumor containing fetus attached to left wall of uterus by *a* (*c*) pedicle having the anatomic characters of a uterine cervix; *f*, left tube and ovary removed with tumor; *g*, vagina (Australasian Med. Gaz., May 20, 1902).

35 recovered, or 83 %. A. Donald and W. K. Walls¹ record an interesting case of spontaneous rupture of a bicornuate uterus during pregnancy at the onset of labor (Plate 3). There was an extensive tear between the two horns with escape of the fetus into the abdominal cavity. The patient recovered after operation. [It seems evident that the result of rupture of the uterus depends more upon the circumstances of the case and the extent of the rupture than upon the method of treatment. When the rupture is complete, the mortality is high under any form of treatment. When the rupture is incomplete and but a small portion of the fetus, if any, escapes into the abdominal cavity, the treatment by drainage with gauze gives the best results yet obtained. It is worthy of note that what is called "secondary operation" through the abdomen gives a

¹ Practitioner, Jan., 1903.

PLATE 3.



Double uterus with rupture of cervix and maldevelopment of fundus (anterior surface) : *a*, Gap between the two horns covered only by peritoneum ; *b*, *b*, fundus covered with peritoneum ; *c*, *c*, Fallopian tubes ; *d*, *d*, cut edges of broad ligaments ; *e*, *e'*, ruptured cervix ; at *e*, part is missing and the rupture extends into the right broad ligament, in a more or less horizontal plane ; *f*, *f*, ovaries ; *g*, ovarian cyst (Donald and Walls, in *The Practitioner*, Jan., 1903).

better result than primary operation. By the term "secondary" is meant the fact that the operator removes the child through the vagina before opening the abdomen to care for the uterus. Whenever possible, the vaginal removal of the child and appendages lessens slightly the mortality for the mother.]

Pregnancy in a Double Uterus; Removal of Pregnant Portion.—M. Jay¹ reports the following case (see Fig. 65): The subject of this remarkable tumor was a woman 25 years of age, the mother of one child, the confinement having been normal. She was not subject to any disturbance of menstruation. She consulted the physician in September, 1901, complaining of backache, lassitude, and a vaginal discharge which commenced with a miscarriage some months previously. On examination there was found some erosion of the os, the uterus was enlarged, retroverted, and pushed to the right. An ill-defined swelling was found in the broad ligaments, this tumor seeming to spring from the left uterine wall. An operation was advised. In November pregnancy supervened and the operation was postponed. In December there was uterine hemorrhage, recurring daily, and a curetment was done. The uterus was found to be enlarged and pushed still more to the right. It was empty. The tumor had considerably enlarged. She improved after the curetment with the exception of persistent nausea. The following February the abdomen was opened and a tumor found to the left of the median line. On the right the uterus was brought into view, and attached to it was only one tube and ovary. The left tube and ovary were normal and were found attached to the left side of the tumor. The tumor took its origin about 2 inches from the fundus of the uterus. The patient was placed in the Trendelenburg position and the left ovarian artery and the layers of the broad ligament were opened. The tumor was then enucleated down as far as the uterine artery, which was tied. The tumor was found to spring from the uterus at the junction of the cervix with the body, by a pedicle an inch in diameter. This was fixed and tied, and the tumor removed. On cutting through the pedicle which resembled an ordinary cervix, a small opening was exposed in the tumor, from which projected a thick plug of mucus. The pedicle was tied off and the stump covered with peritoneum, the tumor being removed. The uterus, which presented a lop-sided appearance, with its one tube and ovary, was then fixed to the parietal peritoneum and the wound closed. On opening the tumor it was found to contain a 3 months fetus. The specimen presented all the anatomic characters of a pregnant uterus removed at the cervix, and having only one tube and ovary. The patient made a good recovery.

FETAL DYSTOCIA.

The Mechanism of Posterior Presentation.—[The variations in the form of the mechanism are dependent upon the size of the pelvis and upon the size and degree of flexion of the child's head. The greatest

¹ Australasian Med. Gaz., vol. xxi, No. 5, May 20, 1902.

complexity manifests itself at the brim.] Sigmar Stark¹ believes that there are 4 forms of mechanism encountered at the brim: (1) The entrance of the occiput in the "diameter of favorable engagement" with the head in the state of excessive flexion; (2) arrest of the occiput, descent of the sinciput, release of the occiput with re-establishment of flexion; (3) arrest of the occiput, descent of the sinciput, and conversion into a face-presentation; (4) arrest of the occiput, descent of the sinciput, impaction, and arrest of labor. When the occiput reaches the pelvic floor, and often even earlier, the next phenomenon in the mechanism of labor becomes manifest. The occiput rotates either anteriorly or posteriorly. The requisites for anterior rotation are good pains, flexion, and a relatively rigid pelvic floor. If the head be in a position of extension, the sinciput rotates anteriorly according to the law of obstetrics, that the most dependent portion rotates to the front. Good pains and a relatively rigid floor are essential in order to establish the proper balance between the forces of expulsion and resistance. In every case of labor in an occipito-anterior position when the occiput gets locked beneath the arch of the pubis, the following take place: The chin, being the only portion free to move, leaves the breast of the child and the head extends; the occiput is arrested; it can advance no further; it can rotate neither forward nor backward; and finally the chin, as the only part of the head free to move, leaves the breast of the child and the head extends, and labor terminates as a face-presentation. The occipitomenal diameter of the head is 5 inches, the oblique diameter is 6 inches; hence the extension of the head is entirely impossible. Probably this form of mechanism may occur, but the author cannot conceive that it is possible unless the head is undersized or easily molded.

The Management of Posterior-occipital Positions.—[Posterior positions of the occiput almost always right themselves, even when left to nature, and the management should consist in properly understanding and facilitating nature's methods.] W. J. Cavanagh² points out that this rectification on the part of nature depends, however, upon a proper flexion of the head, so that when the occiput strikes the pelvic floor it will be the most advanced presenting part and will be rotated by the forces around to the front. If the case is seen early before the membranes have ruptured, it is frequently possible to avoid any dangers by a preliminary rotation of the head, which may be effected by having the woman assume the true genupectoral position and retain it as long as her strength permits, or until vaginal examinations without change of position show that rotation has taken place. Should the occiput, after becoming anterior, show a tendency to return to its posterior position, rupture the membranes to hasten engagement of the head. If this is unsuccessful, no hesitation should be felt in allowing nature to take her course in these early cases. The degree of flexion should then be watched, and if not satisfactory, firm resistance, not pressure, should be made upon the sinciput to prevent any further advance, and the actual flexion of the head should be left to the pressure exercised on the occipital end

¹ Am. Jour. Obstet., Jan., 1903.

² N. Y. Med. Jour., April 11, 1903.

by the uterine forces. If the case is not seen till labor has so far advanced that simple pressure is of no avail, one of two methods may be employed: (1) Anesthetize fully, pass the hand into the vagina, push the head gently up out of the pelvis, above the superior strait, then flex it and rotate the occiput forward, holding it in position till the pains, aided by pressure from without, cause an engagement of the head. (2) Delivery by the forceps reversed. This is not a difficult procedure. The blades should be introduced so that the cephalic curve passes over the ears, with the convexity forward and the tips resting upon the occiput. When traction is made, which should be gentle and with one hand, the occiput is naturally drawn down, the head, tilting on its attachment to the spinal column, yields to the leverage thus applied, and, the frontal end being forced up, flexion is at once established and the occiput becomes the lowest part. The forceps should then be removed, and, if necessary, to complete delivery they should be applied in the normal method. Rotation will almost always occur if good flexion is obtained even though the head is very low. [This is a dangerous procedure save in the hands of the most expert.] Sometimes when flexion seems impossible a safer and more speedy result may be obtained by causing complete extension of the head, thus converting a brow-presentation into the most favorable variety of face-presentation, viz., that in which the chin presents under the pubic arch.

Heredity and Twins.—[The question of multiple births is one of perennial interest. Physiologists and obstetricians have exhausted their ingenuity in the endeavor to find out how they occur, but hitherto without success. In 1879 Goehlert, in a long article illustrated by numerous genealogic tables, declared that there was much reason to believe that the tendency to produce twins was hereditary. The same thing has been asserted and denied with regard to the lower animals, although there can be no doubt that multiple births are the rule in certain species, and single births in others. Moreover, there can be no doubt that this tendency bears a close relation to the size of the animal, the larger animals rarely having more than one offspring at a birth, the smaller animals rarely so few. Of course, the relationship of multiple births to the manner of life, to the dangers to which the offspring is exposed, and to various other factors, is quite obvious. We know, for example, that a single pair of certain species of fish could fill the ocean with a solid mass in the course of a very few years if all their offspring developed and in their turn had the usual number. It is not *a priori* impossible, therefore, that this hereditary tendency could exist in human beings. Of course, the cases that are cited in which a single married pair will have a series of twins, or a series of triplets, or in which, as in one instance, two brothers had each a series of twins, may be accidental, even if they actually occur. The doctrine of probabilities applied to such a vast number of variable individuals as is the childbearing part of the human race could give rise to some very extraordinary facts without implying the existence of recondite laws.] Recently Naegeli-Akerblom,¹ in a most interesting

¹ Virchow's Archiv, Bd. clxx, H. 1 u. 2, 1902.

article, has undertaken a careful critical study of the whole subject. The amount of labor that this has involved is enormous, and the frankness and evident sincerity with which the results have been stated lead us to place considerable faith in his conclusions. He touches upon so many points that it is hardly possible to consider his article as a whole. In all these studies it is necessary for the statistician to select the most distinguished class of persons, and the family records of the nobility of Europe go further back and are more accurate than those of any other class. As a result they were the material from which Goehlert drew his conclusions, and it has been a renewed study of this material that has furnished the basis of Naegeli-Akerblom's criticisms. There are several distinguished families in whom, it has been alleged, a tendency to have twins existed. Possibly the most distinguished is the house of Capet of France. Another is the family of Solms-Laubach, and another the house of Hanau. The chief criticism found with Goehlert's data regarding these three families is that his historical studies were inaccurate. In many instances he stated that twins were born of certain families, when, as a matter of fact, we have no historical data upon which to base such a conclusion. Another factor, however, upon which Naegeli-Akerblom lays great stress, is the confusion of the lines. The tendency to intermarry is so pronounced among European nobility that the house of Solms-Laubach, for example, is related by marriage to no less than 65 reigning families of Europe, practically all there are. The point which seems to have escaped Goehlert is, whether to these families, taking the genealogy as given, more twins are born than occur ordinarily, according to the statistics obtained from large maternity hospitals. Now, it is known that in every 84 births 1 twin birth occurs, and from a study of these tables it appears that, as a matter of fact, only 1 birth in 89 is multiple. Now, as a result of the continual intermarriage, it seemed reasonable to suppose that the tendency to produce twins would be greatly exalted, and this is undoubtedly not the case. This whole question of heredity, and particularly hereditary tendencies occurring in many generations, is exceedingly involved. It is not generally appreciated how rapidly a man's ancestors increase in the not-too-distant past. Presuming that there were no intermarriages, the ancestors of any individual now living must, at the time of Charlemagne, have exceeded considerably the greatest possible total number of inhabitants in the world. It requires merely a feeble imagination to picture the great diversity of hereditary influences that act upon each of us, for in such a vast number there must have been representatives of every type of character from a genius to a criminal, of every type of conformation, of feature, or of physical tendency. And if one should be sufficiently curious, and have access to the data, it would be possible to ascribe the minutest peculiarities of any individual to atavistic inheritance. What profits it, then, to waste time, energy, and intelligence upon such fruitless and impractical inquiries? Naegeli-Akerblom takes occasion, as a result of the very considerable statistical information, to discuss the expectation of life in twins, and he finds, contrary to the statements of Goehlert, Weinberg and others, that, granted

they survive birth and the first year of life, their expectation is quite as good as that of single births. He notes some remarkable instances in which both members of a twin birth survived past 80 years of age. In 151 instances 97 of the twin births exceeded 21 years of age, and, of these, 34 exceeded 60 years of age. [Not a bad showing if we compare it with the expectation of life in insurance-tables! Now, what is the conclusion of all these extensive historical investigations going back to the eighth century? We may quote the final paragraph, which runs as follows: "What may we conclude from this? Only that for the moment we rest under the ban of systematic investigations; that we continually strive to classify all natural phenomena as well as we can. Further, that we know nothing concerning the cause or origin of twins, triplets, etc., and that it is not likely that in any reasonable time we shall know any more." And the lame but not altogether impotent conclusion of all is that we do not know. This is at least better than fine-spun theorizing or high-sounding terms and periods with which to cloak our ignorance.]

Multiple Pregnancies.—An editorial in the "Lancet"¹ remarks that the subject of prolificity and multiple pregnancy has always excited the greatest interest among both ancient and modern writers. We find Aristotle, who thought that the population should be fixed as regards numbers, recommending legislation to prevent its increase and, as he thought, the consequent deterioration of the race. Whether we regard multiple pregnancies as a result of heredity, or as an example of atavism, or merely as a consequence of undue prolificity, we are confronted with problems of much interest. It is, indeed, only of late years that our knowledge of the laws of fecundity have been based upon well-ascertained facts. The influence of heredity in the production of multiple births has long been a matter of popular belief, and the investigations of numerous observers have shown that this belief is well founded. Goehlert, from a study of genealogic tables which enabled him to ascertain the fruitfulness of certain families throughout several generations, has found that the tendency to the production of multiple pregnancies is undoubtedly transmitted from parent to child, and that the hereditary influence is decidedly greater when not only the mother but also the father are members of such prolific families. J. W. Ballantyne has published some most interesting cases of this kind, in which the relationship between large families and multiple births is well shown. One of the most striking is that of a woman who had 22 children in 18 confinements—4 times twins and 14 single births; one of her sisters had had triplets and another had given birth to twins. The influence of the male parent has been pointed out by Goehlert and is illustrated by the case recorded by Merriman. It is that of a woman who had 21 children in 7 consecutive births. They were all born alive and 12 survived. That some of the credit for this extreme fecundity may justly be ascribed to the father would seem to be shown by the fact that a female servant seduced by him gave birth to triplets who lived for 3 weeks. Leroy quotes the case of 4 brothers in whose families 2 pregnancies in the

¹ February 7, 1903.

parents of a collateral branch had been observed. All 4 were the fathers of twins, 3 of them twice each and the fourth 4 times. Possibly this record afforded the foundation for the story of the French family, the male members of which had acquired such a reputation as the fathers of twins and triplets that after a time no woman could be found who would consent to marry any one of them. If we may accept the observations of Hellin, it would appear that the occurrence of multiple births is directly connected with a relatively large number of egg-follicles in the ovary, and is due to a persistence of the embryonic condition of that organ in which the number of follicles is very much greater than it is at subsequent periods of life. The chances of triplets surviving are but small. Ruppin has calculated that the mortality of the children in twin pregnancies is double and in triplet pregnancies 4 times that of the mortality in single births. The fact that more boys than girls are born in the population as a whole appears to hold good in the case of triplets. The figures given by Ruppin show that the commonest combination of sexes is 2 boys and 1 girl, then 1 boy and 2 girls, then 3 boys, and, lastly, 3 girls. According to him, the relative proportion of the two sexes in this variety of multiple pregnancies is 104 boys to every 96 girls. The interdependence that exists between general prolificity and multiple births is shown by the statistics of the two conditions. In France, for example, where the general prolificity is low, twin pregnancies occur about once in every 92 births, as compared with a general frequency of about once in every 80 births, according to Hellin. He finds that the frequency of multiple births varies not only in different countries but in different districts in the same country. The formula he gives is a convenient one for estimating roughly the frequency of the occurrence of multiple births. If twins be taken as occurring about once in every 80 births, then 80^2 , or 1 in 6400, represents the frequency of the occurrence of triplets; 80^3 , or 1 in 512,000, that of quadruplets; and 80^4 , or 1 in 40,960,000, that of quintuplets.

OBSTETRIC OPERATIONS.

Use and Abuse of Forceps in General Practice.—M. Dewar¹ thinks the large majority of injuries attributed to forceps is due to their use by the inexperienced. Every obstetrician ought to be an expert. City women demand help much more frequently than country women, who endure all kinds of pain heroically. Inertia is common in city practice, and if unduly prolonged requires help. He has never had post-partum hemorrhage after forceps-delivery, not even in inertia. He almost never applies instruments unless conditions indicate their use, never unless the os is fully dilated, or dilatable, except at the onset of convulsions or other dangerous complications. He records the mortality statistics collected from other practitioners, together with those of 1000 deliveries of his own. Of 300 city cases with a forceps percentage of 35 the maternal mortality was 0.3 %; infantile, 1.6 %; this is much

¹ Amer. Med., Dec. 20, 1902.

better than that of the 700 country cases with a forceps percentage of 11 and a maternal mortality of 0.57 %; infantile, 2.8 %. [This compares favorably with records of hospitals, where strict antisepsis can be employed.] L. V. Friedman¹ has devised an excellent modification of Tarnier's axis-traction forceps (see Fig. 66). This instrument is cleanly and the supplementary handle is easily applied.

Pubiotomy in Obstetrics.—[The results of 346 cesarean operations performed by 11 renowned operators showed a mortality of only 23, or 6.6 %, and a competent man working under favorable circumstances on suitable cases need fear no mortality from this procedure. In symphyseotomy injuries may occur which cause a prolonged convalescence and even lead to the death of the patient. Rubinroth, examining the world's literature of 3 years, 1896-98, found 136 cases of symphyseotomy with a maternal mortality of 11 % and an infantile mortality of 14 %. These statistics are not encouraging to the advocates of this operation; neither will American obstetricians be likely to regard with much favor

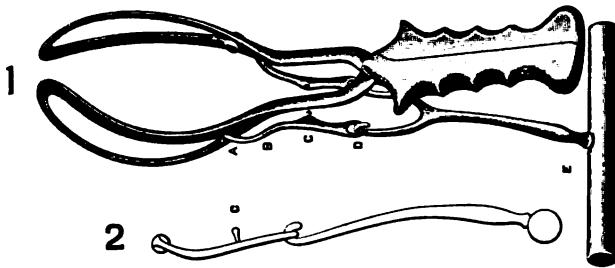


Fig. 66.—Friedman's modification of Tarnier's axis-traction forceps: 1, Instrument in position for traction; 2, shows side view in better detail. The rods attached by Higgin's modification (A) are short; when in place they do not reach the lock. They follow the curve of, and lie flat on the under surface of the shanks. It is this inward curve (B) which is mentioned above as a protection to the perineum. During application each rod is held fast to the shank by a small pin (C). At the lower end of each rod is an oval eyelet (D) to receive the hooks of the handle. The bar is similar to those now in use, but at (E) it holds by a lock-joint, instead of a screw, the curved upright which bears the hooks.

the revival of the operation of pubiotomy, which has been selected by some obstetricians in preference to symphyseotomy. The operation has been chosen for cases in which the symphysis is a synostosis instead of a synchondrosis. It probably has its place in a Naegele pelvis delivery in which the operation termed ischiopubiotomy has been performed by some operators. The distinctive feature of a Naegele pelvis is the atrophy of one lateral mass of the sacrum, producing an obliquely contracted pelvis. On the side on which the ankylosis of the sacroiliac joint is found, the pelvis is cut with a chain-saw in two places, in the ascending branch of the pubis 5 cm. from the median line, and where the descending ramus joins the ascending ramus of the ischium. After the bones are cut, according to Garrigues, it is necessary bluntly to separate the obturator membrane along the outer border of the ischiopubic branches in order to obtain a separation of the ends. By the gaping of these bones, combined with the mobility at the symphysis and the other sacroiliac

¹ Boston M. and S. Jour., April 9, 1903.

articulation, enough space is gained for the passage of the head.] H. van de Velde¹ has advocated in cases of obstructed delivery a similar operation, terming it *hebotomy*, claiming that it has little danger for the mother and is favorable to the child, besides presenting no difficulty for the obstetrician. [In spite of such advocacy, we still believe in the superiority of cesarean section over either of these operations upon the osseous structure of the pelvis, the comparative mortality being sufficient ground for this preference.]

Pelvic Changes in Symphyseotomy.—Sandstein² finds that after symphyseotomy 3 sorts of motions occur in the pelvis. The first is the movement of the pubes outward by rotation of the innominate bones on vertical axes passed through their respective iliac joints. This he considers of little importance. The second movement consists in rotation of the innominate bones on a horizontal transverse axis passing through the sacrum; this carries the pubes downward. Besides these two movements, a third and hitherto undescribed movement occurs. This consists in rotation of the innominate bone on its axis so as to cause the ilium to become more erect or vertical. This movement of itself would cause shortening of the interspinous and intercrystal diameters were it not more than compensated by the outward movement of the bones after pubic section. The writer considers that Walcher is correct in maintaining that the pubes move downward to a considerable extent. Regarding the increase in the various diameters of the pelvis, the *conjugata vera* was increased 1.67 mm. per centimeter of pubic separation. Roughly speaking, 6 cm. of pubic separation give 1 cm. of increase in the *conjugata vera*. The diagonal conjugate increased nearly 2 mm. and the intertrochanteric over 6 mm., the intercrystal 2.4 mm., and the interspinous, 5.61 mm. per centimeter of pubic separation. The transverse diameter of the brim increases 4 mm. and the right and left oblique diameters of the brim 3.84 mm. and 3.9 mm. respectively. By comparing the gain in various diameters, it is seen that the true significance of symphyseotomy during labor lies mainly in the fact that it permits increased descent of the pubic bones. Symphyseotomy is a means of obtaining greater effects than we can by Walcher's position. By Walcher's position the pubes can be depressed not more than 5 mm., whereas by symphyseotomy with 6 cm. of pubic separation the mean depression of the pubes is 8.4 mm. The danger of pubic separation lies in the damage done to the vulva, to the anterior vaginal wall, the urethra, and the bladder. Pubic separation should be limited, if possible, to a maximum of 6 cm. Symphyseotomy, then, must be limited to cases in which by a gain of 1 cm., or $\frac{1}{2}$ inch, in the true conjugate, the child may safely be delivered. The true conjugate must certainly not be below 7 cm., and should be above this measurement. The child must be living, and Walcher's position must be used, with support to the sides of the pelvis. Care must be taken to counteract unequal movements on the two sides of the pelvis. By flexing the thigh of the non-moving side and abducting

¹ Amer. Med., Nov. 15, 1902.

² Jour. of Obstet. and Gynec. of the Brit. Emp., March, 1902.

the bent-up knee, that side can be made to move equally with the other side, and the rupture of the ligaments avoided or delayed. The symphysis should be severed with a broad-bladed knife, and division of the subpubic ligament should not be aimed at. The ligament prevents the extension of the wound down into the vulva. Ossification of the pubes does not occur, and hence the operator can always cut through cartilage. In 13.3 % of cases the joint was in the median line, in 66.3 % on the left side, and in 20 % on the right. The tubercle upon the upper surface of the pubes is the best guide. Rigid asepsis is necessary, and infected cases should not be subjected to the operation.

Fritsch's Fundal Incision.—In connection with the operation of cesarean section, there are at the present moment 3 important questions *sub judica*. These are: (1) The conservative section versus Porro's, or intraperitoneal hysterectomy; (2) the sterilization of the patient if the conservative operation is chosen; and (3) the direction of the uterine incision. So says J. M. Munro Kerr.¹ In 1897 Fritsch first recommended the transverse fundal incision, because of the ease with which the child can be extracted from the gravid uterus. The advantages claimed by Fritsch and substantiated by the writer are: (a) The abdomen is opened into higher up, and so there is less risk of subsequent hernia; (b) by pulling the fundus well forward, the escape of blood and liquor amnii into the abdominal cavity can be better prevented; (c) the child can be more easily extracted; (d) the placenta is less frequently cut down upon; (e) there is less bleeding; (f) there is greater diminution of the wound, and less stitching is required. The objections urged against the operation are: (1) The incision makes adhesions to the bowel more liable, which may interfere with the involution of the uterus, and that discomfort from dragging on the abdominal wall will follow; (2) the uterus may become fixed to the abdominal wall 3 to 5 inches above the symphysis; (3) in case of any infection of the uterus general peritonitis is more liable to follow. This is not so great with the longitudinal incision, for it becomes shut off from the peritoneum by adhesion with the anterior abdominal wall. The danger of rupture of the uterus in a subsequent pregnancy is still a matter on which one cannot speak with any assurance, and certainly one cannot yet compare the danger of rupture after a longitudinal with the danger after a transverse fundal incision. Curschmann² collected 119 cases of cesarean section by transverse incision of the fundus. He gives statistics to prove his belief that the transverse incision offers no essential advantage over the usual incision upon the anterior uterine wall. He supports his assertion by measurement of the uterine wall at the fundus and anteriorly, by a comparison of convalescence after the two methods, and by minute study of the cases. The mortality was 12.1 %, or 13 cases, 11 of which were cases in which the uterus was retained, and 2 cases in which the uterus was removed. One patient was admitted to the hospital in a septic condition. The causes of death were as follows: Carcinoma of the uterus,

¹ Jour. of Obstet. and Gynec. for Brit. Emp., July, 1902.

² Monats. f. Geburtsh. u. Gynäk., 1902, Bd. xvi, Heft 5.

1; purulent bronchitis, 1; embolism of the lung, 1; death from shock immediately after the operation, 1; peritonitis, 8. In 3 cases autopsy showed adhesions of coils of intestine with the uterine wound. This was also seen in several cases which recovered in which it was necessary to do abdominal section for the relief of obstruction of the intestine. Repeated cesarean section was done in 10 cases, in 8 of which the first operation was made by longitudinal incision in the anterior uterine wall, while in 2 transverse incisions of the fundus had been practised. In all of these cases there was adhesion between the uterus and the abdominal wall and omentum. No scar in the uterus could be discovered in these cases. Of these 10 repeated sections, 7 recovered without fever, 1 had fever and recovered, and 1 died.

Vaginal Cesarean Section. Bumm¹ describes 13 cases of this operation with 1 death which occurred 3 hours after the operation in case of eclamptic coma. The 8 cases which came to the hospital in an aseptic condition recovered without fever. Fever occurred in 4 cases, one after removal of a fetid cancer, two were cases of eclampsia and one of nephritis. While at first cervical carcinoma was the most frequent cause for vaginal cesarean section, Bumm thinks it should now be used in many cases of eclampsia, he having been brought by a year's experience of different methods to the opinion that in cases of eclampsia delivery should follow the first attack, and that the vaginal method is simpler and less dangerous than the classic cesarean section, and in his opinion is much more certain and exact than the use of the metallic dilators now in vogue. In one case this method was used on account of severe hemorrhage from a deep-seated placenta. He deems it advisable also when a torpid uterus reacts very badly, or not at all, in response to any irritant or stimulant such as manipulation or introduction of instruments so liable to cause infection. He advises early operation so as to preserve the fetus intact and uninjured.

THE PATHOLOGY OF THE PUERPERIUM.

The Treatment of Septic Infections with Intravenous Collargolum Injections.—Credé² states that the intravenous injection of collargolum by no means does away with the use of unguentum Credé; on the contrary, the great majority of the cases can be cured by ointment inunction, which is more readily employed and more agreeable to the patient. But when the skin is not sufficiently absorptive, when inunctions are painful, and when the infection is so virulent that the greatest possible rapidity and energy of action are required, the intravenous injections are indicated. The syringe, which should hold from 5 to 10 grams (1½ to 2½ drams), should not be cleansed with chemical solutions, but should be sterilized by boiling, followed by distilled water or alcohol. A few drops of the new collargolum in water should give a clear brown color; while the decomposed collargolum gives a turbid, gray emulsion. The technic of the intravenous injection in subjects with well-

¹ Zent. f. Gynäk., Dec. 27, 1902.

² New Eng. Med. Monthly, April, 1903.

filled visible veins is extremely simple. A bandage or handkerchief is tied around the pendant arm tight enough to render the veins at the elbow tense and swollen. The detached needle is inserted through the cleansed skin into the vessel, the flow of blood showing when its point is free within the vein. The cannula is steadied with the left hand, and the syringe, not quite filled with the silver solution, is attached; a small amount of blood is then drawn up into the solution, so that any air-bubble that may be present rises to the top of the fluid and is not injected. During the injection the arm is steadied in a horizontal position to facilitate the rising of the air. Introduction of the needle attached to the syringe, and determining the fact of its introduction into the vein by the mobility of its point, are liable to occasion error. Collargolum is not absorbed when employed subcutaneously, but it may possibly be absorbed when injected into very vascular muscular tissue. The solubility of the improved collargolum allows the use of a 2 % solution; so that 2 to 10 cc. ($\frac{1}{2}$ to $2\frac{1}{2}$ drams) or 0.08 to 0.12 gram ($1\frac{1}{5}$ to $1\frac{3}{5}$ grains) suffices for an injection. When the collargolum is employed in time, before the brain and heart have lost their powers of resistance, and before metastases have occurred, there is a plain improvement in a few hours after its introduction into the blood. The patient becomes quieter, and feels better; sweating may set in, and the pulse and temperature improve. In severe cases the improvement may be short and transitory, and the injection must be repeated in 8 to 12 hours; but it usually persists for from 24 to 36 hours, about as long as the silver remains in the body. The quicker the improvement disappears, the sooner must the silver be given again and the larger the dose required. Cumulative action does not occur; as many as 20 injections have been given to one patient, though Credé himself never gave more than 7. Credé puts on record the fact that neither in his own extensive experience nor in that of others has there ever been any mishap from the intravenous collargolum injection; there has been no undesirable general reaction, nor any trouble from the local puncture of the vein. Wernitz¹ advocates the abundant and methodic **introduction of fluid per rectum** as an effectual means of combating sepsis. By this means the urinary and perspiratory secretions are greatly stimulated and the poison which is circulating throughout the organism is rapidly eliminated. This elimination is so abundant and rapid that in some cases of severe sepsis in 7 of 8 hours the dangerous condition is overcome by this simple, safe, and practicable means. At the beginning of this treatment there should be a thorough cleansing of the intestinal canal and the freeing of the same from gases. The excessive distention of the abdomen interferes with the heart-action and can easily lead to a fatal result. Hence the emptying of the intestinal canal may be essential to save life. He emphasizes the statement that the introduction of copious amounts of fluid per rectum is generally a valuable remedy for acute septic infection.

The Formalin Treatment of Septicemia.—An editorial in the "Journal of the American Medical Association"² very wisely remarks as

¹ Amer. Med., July 26, 1902.

² February 7, 1903.

follows: A patient with puerperal septicemia recovered after the intravenous injection of formalin solution. We are told that the case was regarded as hopeless and that the effect of the formalin injection was "magical." This episode has been exploited in a sensational manner in the daily press and it has been heralded in medical journals as a discovery and an epoch in the history of medicine. While all would welcome the demonstration of a successful treatment of septicemia, there is unfortunately the very best of reasons for questioning the correctness of the inference that the recovery in the case referred to resulted directly or indirectly from the injection of formalin. The reasons for this doubt may be presented under two heads: namely, (1) the now well-known occurrence of spontaneous recovery from various forms of septicemia, or blood-poisoning, and (2) the inadequacy of available evidence to show that formalin solution has any bactericidal or curative effect when introduced into the circulation of infected animals in nonfatal doses. Every physician of experience has had the opportunity to observe apparently "hopeless" cases of septicemia suddenly change for the better, and perchance after a remission or two go on to recovery. The bad prognostic significance formerly and even now attached to the diagnosis of septicemia or blood-poisoning is sure to undergo considerable modification as the results of bacteriologic examinations of the blood during life and according to approved methods become more generally known. It has been shown conclusively that cases of bacteriemia, be it streptococcemia, pneumococcemia, or staphylococcemia, may recover spontaneously even when the blood has been found to contain large numbers of bacteria, and even when metastatic foci, such as articular inflammations and endocarditis, have developed. This being the case, the recovery in a single, isolated instance of streptococcemia injected with formalin proves little or nothing in regard to the value of the latter. For aught we know it might be nearer the truth to say that recovery resulted in spite of the formalin injections. We cannot regard the puerperal septicemia "as an otherwise fatal condition." In 47 cases of bacteriemia, demonstrated to be such by cultures from the blood during life by Bertelsmann,¹ death took place in 26. In this series there were 28 cases of streptococcemia, and of these 13 died. Other examples of this kind could be cited. Recently Herrick² has collected a number of cases from the literature of recovery after undoubted malignant endocarditis. He is fortunate enough to furnish the anatomic proof of the healing of ulcerative endocarditis, in 3 cases in the form of healed valvular perforations. [In view of these facts it is self-evident that the actual value of formalin injections in septicemia can be determined, from the clinical standpoint, only by systematic use in a large series of cases under careful control by persons capable of sober judgment.] Coming now to the experimental study of the curative and bactericidal action of formalin solutions in infected animals, then we may say, in brief, that the results so far are

¹ Verh. o. Gesellsch. f. Chir., 1902, xxxi, 291-304.

² Trans. Assoc. Am. Phys., 1902, xvii, 468-483.

not at all encouraging. Fischer and Ticken¹ found that repeated intraperitoneal injections of formalin 1:2000 or 1:1000, in doses of from 4 to 8 cc., had an unfavorable influence in guineapigs with peritoneal tuberculosis. The injected animals were less able to resist the tuberculous infection than those not injected. Fortesque-Brickdale² found that formic aldehyd in large doses so depresses animals infected with pneumococci that they die sooner than an untreated animal used as control. Formalin, *i. e.*, formaldehyd,—according to Waldemar Koch,³ interferes with the normal proteolytic processes in the cells, and hence it would tend to reduce rather than strengthen the cellular resistance to noxious agents. [Certainly not much may be hoped from the use in human septicemias of an agent that has proved so disappointing in animal experiments. Pending scientific investigation, an emphatic caution should be given to the general practitioner. Six or more cases in which this agent was used are already reported in the newspapers, and most of these trials were undoubtedly suggested by the accounts of C. C. Barrow's case in the lay press. This indicates the eagerness of the profession to avail itself of any hope of relief in a desperate condition. The trial should certainly be left to cases *in extremis*.] Barrow⁴ warns the profession against the indiscriminate use of this agent when proper blood-cultures have not been made to determine the cause of the septicemia. The technic of the injection is simple—that of any intravenous infusion and with all the surgical precautions. The solution used has been of a strength of 1:5000 of formalin in physiologic salt solution. As much as 750 cc. has been injected. [In determining the results the value of injections of physiologic salt solution itself, either with or without abstraction of some of the sepsis-laden blood, should be remembered. Control-experiments would be of exceeding value in such cases if they were possible.]

Curettage of the Puerperal Septic Uterus.—W. R. Pryor⁵ says: "In all cases of puerperal fever about 75 % are septic. Therefore the ignorant operator, indifferent as to precise methods, if he curets all cases, will do an indicated operation in about three-fourths of the cases. What will be the result of his work in the other one-fourth—the septic cases? The commission of the American Gynecologic Society, appointed in 1898, made an analysis of every case of puerperal fever reported in the literature of the world for the 5 preceding years, covering the period during which the bacteriology of the puerperal state was actively promulgated. The two men whose observations are the most reliable and whose treatment of septic cases is identical, Whitridge Williams and Krönig, applied no local treatment whatever to the inside of the uterus, doing nothing to it other than what was necessary to establish the diagnosis; and having a mortality of only 5 %. Here, then, we have a basis upon which to work, and we are warranted in saying that, excepting epidemics of particular virulence, but 5 % of women with puerperal

¹ Trans. Chicago Path. Soc., 1902, v, 61–63.

² Lancet, Jan. 10, 1903.

⁴ N. Y. Med. Jour., Jan. 31, 1903.

³ Am. Jour. of Phys., 1902, vi, 325.

⁵ Canad. Pract. and Rev., Sept., 1902.

sepsis will die if the uterus is let alone. The normal mortality of puerperal sepsis then is 5 %. How is this modified by the mistaken curettage of the puerperal septic uterus? In the analysis made by the commission mentioned, we found that curettage of the uterus when bacteriologic examination had been made and the streptococcus found gave the frightful mortality of 22 %. Since being appointed a member of this commission, and for two years previously, Pryor has adopted and perfected a certain method of treatment which he applied to all cases in which he found the streptococcus present in the uterus. This method of treatment, which has been described, gave no mortality either in his hands or in those of the men who have adopted it, except in one class of patients, and these were those who had been curetted before coming into their hands. There were 10 such patients, 3 of whom died, a mortality of 33½ %; and the lesions remote from the pelvis and in the pelvis which were found at the time of operation were in these curetted cases far more general and of a more serious nature than in any others they have seen.

The Operative Treatment of Puerperal Pyemia.—Sippel¹ is induced by Trendelenburg's success in curing a case of puerperal pyemia by ligation of the hypogastric and spermatic veins to draw attention to the fact that in 1894, in a case of purulent phlebitis of the uterus which took the form of acute pyemia, he proposed to remove the uterus and resect the internal spermatic and uterine veins, though he did not actually carry out this proceeding. Of 4 cases of puerperal pyemia, 2 recovered spontaneously; the other 2 could not for independent reasons be operated on, and both died. Sippel is not inclined to the extraperitoneal method suggested by Trendelenburg, and would only proceed by laparotomy, and having done so would remove the uterus as well as the veins; but many a case of pyemia recovers spontaneously, and operation is not indicated unless life is endangered.

Hysterectomy for Puerperal Sepsis.—Vineberg² quotes Fehling's dictum that the attempt to divide the various forms of puerperal infection bacteriologically cannot be considered thus far as successful. Fehling is not an advocate of hysterectomy for puerperal sepsis, though it might be justifiable in those cases in which the sepsis is of uterine origin, due to a retained placenta which could not be removed by the ordinary methods. He does not consider the results obtained by ligating the thrombic pelvic veins encouraging. Leopold divided the cases of severe puerperal sepsis into 6 groups: (1) Cases in which the pyogenic germs have penetrated the uterus and set up a general peritonitis. Hysterectomy in these cases would be useless; for the infection is now in the peritoneum, and there should be an attempt to treat the peritonitis surgically. (2) Cases in which the pyogenic germs attack particularly the venous system and lead to a septic thrombosis. In some of these removal of the uterus is sufficient; in others the affected veins should also be removed. (3) Cases in which the infection principally affects the endometrium and extends and becomes localized in one or other of

¹ Canad. Pract. and Rev., May, 1903.

² Am. Gynecol., Jan., 1903.

the adnexa, in which case the proper procedure is the removal of the affected ovary. (4) Cases in which all the symptoms point to multiple abscesses of the uterine muscularis and pelvic peritonitis. In some of these drainage of the pus-foci may be sufficient, but if the uterus is thickly studded with small abscesses its removal is necessary. (5) Cases in which during labor severe bruising is inflicted upon pelvic tumors, causing gangrene and subsequent peritonitis and often requiring hysterectomy. (6) Cases in which putrefaction of the uterus occurs in consequence of a retained placenta which cannot be removed by the vagina and hysterectomy becomes necessary. Vineberg agrees with Leopold's conclusions. Gradenwitz¹ quotes statistics from many surgeons, showing that the extirpation of the septic puerperal uterus results in a mortality of about 50 %. In 4 years (1898-1902) 113 cases of puerperal fever were treated in a Breslau hospital. In 26 of these the fever, caused by some affection of the internal or external genitalia, decreased after a brief symptomatic treatment, with 3 deaths. In a second group of 23, in which the fever was evoked by a fresh perimetritic or parametritic postpartum abscess, the temperature sank to normal with a conservative operative treatment, involving no deaths. The third group of 26 suffered from putrid placental debris, the removal of which resulted in recovery with one exception. The remaining 38 cases were in an apparently hopeless condition when received, and of these, 21 died. In only 7 of these was it deemed worth while to undertake the extirpation of the uterus, and of these 5 made complete recovery. In 4 of these there was a pronounced local infection, and in 1 the lymphatic form of pyemia. The 2 cases resulting in death were instances of pure septicemia without the presence of any local lesion or suppuration or swelling of the lymphatics.

Puerperal Aphasia.—[Loss of speech during the puerperium is one of the most rare complications, but its occurrence is so alarming to the family and its possibilities so important to the patient that the following notes on the subject will be of interest.] M. A. McIntyre Sinclair² offers the following conclusions on this subject. In considering the prognosis of puerperal aphasia one has to bear in mind many facts which apply equally to other forms of speech-affection. The nature of the lesion, whether functional or organic, nervous or vascular, must be taken into consideration. But looking in a general way at cases one cannot help being struck with the large proportion of recoveries from a primary attack of puerperal aphasia. In some the loss of speech is of a very transitory type; in others complete or partial recovery ensues in the course of a few days, weeks, or months. He points out that the age of the childbearing woman is an important factor, and the vascular conditions are mostly such as to allow of a quick resolution of a thrombus or the rapid opening up of a collateral circulation. A primary attack of puerperal aphasia, therefore, will often lend itself to a more or less favorable outlook. At the same time the liability to recurrence of the aphasia in the event of a subsequent pregnancy is emphasized. This unfortunate

¹ Münch. med. Woch., Dec. 23, 30, 1902.

² Lancet, July 17, 1902.

sequence of events took place in both of Finlayson's cases, in Bateman's case, and in the cases of Gignoux and Leven reported by Poupon. Moreover, the second or recurrent attack in each instance was of a much more serious nature than the attack recovered from in the first instance. In both of Finlayson's cases the secondary aphasia remained persistent and in one case was accompanied by permanent rigidity of the paralyzed limbs. Bateman's case, without the development of fresh symptoms, terminated fatally in 6 weeks. A recurrent attack of puerperal aphasia is therefore a serious matter and the prognosis is grave. Indeed, it is so bad that one must consider the question whether pregnancy ought to be allowed to recur. Poupon, in recognizing the liability to recurrence of the aphasia in a subsequent pregnancy, advises that the woman should be warned to avoid becoming enceinte in the future. The cases of Finlayson and Bateman bear further testimony to Poupon's advice. He would go even further, and say that in the event of the patient again becoming enceinte the only justifiable course, according to present knowledge, is to terminate the pregnancy at the earliest possible moment. Such a procedure was actually carried out in his own case and there has so far been no recurrence of the aphasia. Much need not be said regarding the treatment of puerperal aphasia. This will depend to a great extent on the nature of the lesion, and the attack must be dealt with on the same lines as guide one in the treatment of any other cerebral affection. It would be superfluous to add anything on this score. In addition to special indications for treatment, it will in most cases be necessary to pay attention to the general health of the patient, and when signs of improvement manifest themselves to persevere with the re-education of the faculty of speech. In regard to the latter point he insists that the séances should not at first be too frequent, and that care be taken not to fatigue the patient. In the event of a subsequent pregnancy he expresses the view that for purposes of prophylaxis it is strongly advisable to terminate the pregnancy at the earliest possible moment.

PHYSIOLOGY AND PATHOLOGY OF THE NEWBORN.

Fractures of the Clavicle in Spontaneous Labors.—G. Riether¹ states that a number of cases are reported in which there was fracture of the clavicle in spontaneous delivery. This observation seems to be quite new, and it is of interest to accoucheurs, and has some forensic importance. From June, 1901, until the end of May, 1902, 65 cases were observed in the 3 lying-in clinics of the Vienna General Hospital. The most frequent site of the fracture was in the middle of the bone. In cases in which the separation of the fractured end was incomplete it furnished a greenstick fracture. The symptoms of this condition are not very distinct, and unless the condition of the clavicles is carefully examined it is easily overlooked. A falling forward of the shoulder on the side of the fracture is one of the most constant symptoms. In some

¹ Wien. klin. Woch., No. 24, p. 619, June 12, 1902.

cases there is no abnormal mobility. Crepitation is readily obtained in some cases, and again it is absent. The prognosis is always favorable, due to the power of repair of bone in early life. As a rule, good consolidation is found at the end of 14 days.

Gastrointestinal Hemorrhage of the Newborn.—The occurrence of this malady in the newborn is less at this period, according to J. F. Moran,¹ than at any other time of life, but its mortality is very high—50 %. The etiology is very obscure, and the course of the disease in the cases which recover is about 48 hours. It is self-limited, the hemorrhage usually ceasing with the complete evacuation of the meconium. Among those factors which have been mentioned as the cause of the disease are changes in the circulation incident to the establishment of respiration, delicate condition of the bloodvessels, inherited diathesis, cyanosis, external violence, difficult labor, malformation of the heart and other organs, chilling of the surface, and bacterial infection. There are three pathologic stages of the hemorrhages of the newborn: (1) Those occurring shortly after birth; (2) those associated with some pathologic condition of the blood or bloodvessels, as purpura hæmorrhagica, hæmophilia, and eruptive fevers; (3) those due to local causes, as ulceration in typhoid, severe intestinal inflammation, mechanical irritation, lumbrici, etc. Many authorities claim that constitutional diseases, syphilis, etc., are etiologic factors in the production of the trouble. Klebs (1875) found constantly the bacterium which he named *Monas hæmorrhagica* in the vessels of the newborn dying of melena. The writer thinks that the self-limitation of the disease would seem to show that, whatever the cause, it is but transitory, and the other signs and symptoms are but of secondary importance. The indications for treatment are threefold: to control the hemorrhage, maintain the forces, and remove the cause. In light cases, the promotion of respiration, absolute rest, external heat, bland nourishment, preferably albumin-water and brandy, will usually suffice. The various vegetable and mineral astringents are of little or no avail, as the stomach in the majority of cases is in an irritable condition, which is only aggravated by their action. Salt solution by the rectum is of little use, as it is not retained; combined with gelatin and administered subcutaneously, it has given excellent results. The author reports a case thus treated with cure.

Asphyxia Neonatorum.—[There are several well-known and well-tried methods of stimulating respiration in the newborn, which are familiar to every one. The following, however, may be quite new, and certainly is worthy of attention.] M. Munkevitch² begins by freeing the mouth, pharynx, and upper air-passages of mucus. Then, after having cut the umbilical cord, he proceeds to cause artificial respiration by taking care to give the body of the child a point of support (*un point d'appui*) instead of holding it in suspension, which is one feature of Schultze's method, in common use in France. He seats the infant upon a bed or table, suitably covered to prevent slipping or chilling, with the lower legs extended and separated. Standing behind the child, he places his two

¹ Am. Gynec., Nov., 1902.

² La Sem. Méd., Nov. 5, 1902

hands beneath the axilla so that the thumbs rest upon the shoulder-blades, and the fingers upon the ribs in front. He now proceeds to carry out the movements of respiration with the trunk by flexion and inclination toward the angle of separation between the lower limbs, exerting meanwhile uniform pressure with his hands upon the chest. In this manner he forces the diaphragm upward, while he compresses the chest, and thus brings about expiration. The reverse of this maneuver constitutes inspiration. In order to make the maneuver still more efficient, he sometimes places some tunic rolled into a small mass behind in the small of the child's back. The movements of flexion and extension are repeated systematically, and their rapidity should not be greater than that of ordinary infantile respiration, namely, about 40 to the minute. According to this observer's experience, it is a very efficacious method of causing a child who otherwise might die to breathe. Shucking¹ has been induced by studying the emptying of the placenta and its blood into the umbilical vein by intrauterine pressure to attempt the infusion of saline solution into the umbilical vein as a means of resuscitation when the more common means fail. He reports one case in which the infant was born in an exhausted condition after a prolonged labor. After failure of other means of resuscitation, and the heart-sounds were scarcely distinguishable, he immediately cut the cord and injected about 50 grams of saline solution into the umbilical vein. This reinforced by Sylvester's artificial respiration revived the child successfully.

¹ Med. News, Aug. 23, 1902.

GYNECOLOGY.

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OF PHILADELPHIA.

PRELIMINARY AND GENERAL CONSIDERATIONS.

The Evil Effects of the Corset.—Generations of medical men and some few enthusiastic reformers have repeatedly protested against the use of corsets, and have ascribed to them many of the ailments which are relatively common among women who wear them, but no more comprehensive accusation has been brought against the use of these articles of female attire than that contained in a paper by Williams,¹ of Liverpool, published in the Reports of the Royal Southern Hospital. Williams asserts that the injurious pressure of the corset on the lower ribs and the abdominal viscera interferes with digestion and assimilation, and produces dilation of the stomach and gastric ulceration with subsequent anemia, while at the same time by compressing the base of the thorax corsets throw the diaphragm out of action, and thus are responsible for the thoracic respiration of females, which is described as both abnormal and insufficient. In addition, however, to these injurious results, lateral curvatures of the spine are also said to be due to the injurious pressure of the corset upon the spinal muscles, and Williams concludes his heavy indictment with the statement that by the use of corsets the majority of women are permanently deformed as to their skeletons at 24 years of age, and permanently crippled at 30. [Most observers will admit that numerous evils result from the abuse of corsets; nevertheless it is a fact that many women live to old age in good health, in spite of the compression to which they subject themselves, and it is difficult to see how corsets can be dispensed with so long as it is the custom to wear skirts and petticoats, which are most conveniently suspended from a structure which has a basis of support upon the hips. It is true that some method might be devised for suspending the dress from the shoulders during the day, but this would be impossible in the evening in many cases, and it is by no means certain that the traction of heavy skirts and petticoats upon the shoulders would not have a bad effect upon the thorax and its contents. Experience has shown that skirts worn without corsets and without suspension from the shoulders must be drawn so tightly above the hips that their pressure is just as injurious as that of the tightest corsets. Those who have made the experiment find that female dress

¹ Brit. Med. Jour., Feb. 14, 1903.

with corsets is much more comfortable than female dress without corsets; if the corsets are well built to rest upon the hips, there need be no injurious pressure upon the waist. In other words, it is the abuse rather than the use of corsets which should be deprecated while custom prescribes skirts and petticoats as female garments. Until some series of garments is devised (and accepted) for female wear as becoming and comfortable as those which are at present customary, but capable of being worn without corsets, there is little hope that the latter article will be dispensed with. It would appear, therefore, that possibly the best way to avoid the evils corsets cause would be to educate females to the appreciation of the fact that not only is the normal waist the most graceful, but also that properly built corsets resting well upon the hips will display the normal waist to the greatest advantage, and obviate the necessity for any injurious compression.]

The Thyroid Gland and the Genital Organs.—An editorial in "American Medicine"¹ states that the peculiar relationship between the thyroid gland and the female genital organs is a fact that has been fully recognized. It is well known that any condition which will produce an enlargement of the uterus will give a corresponding increase in the size of the thyroid gland. During pregnancy the gland will become large, soft, and pulsating, and may so impinge upon the trachea as to produce a certain amount of dyspnea. After the termination of gestation it diminishes in size to a certain extent, but seldom returns to its original proportions. Valentine has noted that in 25 pregnancies in which the usual hypertrophy of the thyroid did not occur, in 20 there was albuminuria. In cases in which large doses of thyroïdin were administered to pregnant women, in whom the physiologic enlargement of the gland was present, a marked diminution of the gland resulted. Lange has also given thyroïdin to a patient in whom there was a pathologic enlargement of the thyroid during pregnancy with a similar result. Another interesting point in Lange's paper is that when iodothyryn was administered to patients suffering from the nephritis of pregnancy, it was found to produce a distinct diuretic effect. Of other interesting communications upon this subject, two are worthy of special mention: the first by Fisher,² in which he calls attention to the influence of the genital apparatus upon the healthy thyroid gland, as occurs at puberty, during menstruation, the puerperium, lactation, sexual excitement, the menopause, and genital disease. He emphasizes the influence which a removal of part of the thyroid gland has upon the physiologic and pathologic condition of the genital apparatus, and concludes: (1) That certain occurrences which influence the genital apparatus, such as puberty, pregnancy, and uterine fibroids, which produce a distinct change in the metabolism of the entire organism, very frequently cause an enlargement of the thyroid gland. (2) That the deficiency of normal thyroid secretion is often associated with atrophic changes in the genital apparatus. The second report, by Hestoghe,³ establishes the fact that women deprived of the thyroid gland

¹ October 25, 1902, page 673.

² Wien. med. Woch., Nov. 6 and 9, 1896.

³ Rev. Méd., Jan., 1899.

are subject to excessive menstrual discharge; as they grow older the menses last longer, and finally become almost a constant flow. He also noted that a hypertrophied thyroid is always accompanied by an early and copious mammary secretion, and that thyroid extract is useful in stimulating the secretion of lacteal fluid, and should be administered when the secretion is diminishing. Hestoghe¹ further believes that thyroïdin is indicated in cases of frequent abortion, in which the menstrual flow is so excessive that it sweeps away the impregnated ovum; he cites an instance of its advantage in sterility, and recommends its use in myoma, prolapsus, and uterine congestion.

The Röntgen Ray in Gynecology.—An editorial in "American Medicine"² says that the success attained by Finsen in the treatment of the various dermatoses by concentrated chemical rays has impressed the profession with the possibilities of the *x*-ray as a therapeutic agent in the treatment of malignant disease. The remarkable results attained at the Finsen Institute at Copenhagen justify a favorable opinion of this method of treatment. The action of the remedy is very slow in most instances and its effect upon an internal growth uncertain. We certainly feel that the field of experiment with this procedure should be confined to recurrent or inoperable cases, and that the physician is not justified in delaying operation upon a favorable case in order to test this method. However, if the case is inoperable when it comes under the surgeon's observation, or has recurred after skilful surgical intervention, then experimentation is undoubtedly warranted. Although the *x*-ray may sometimes be of value to the gynecologist or obstetrician in diagnosis, it is of far less use to either of these than to the general surgeon who deals with the osseous system. The *x*-ray picture of the pelvis, according to Delphey, is often indistinct and unsatisfactory, and would rarely afford much assistance to the gynecologist who had already become expert in the palpation of this region. Better results were obtained above the pelvic bones; for example, in the study of the ureters and kidneys and for the localization of calculi in those structures. It is possible that the presence of bone in dermoid tumors or of calcareous plates in benign growths might be demonstrated, but this is of minor importance, as the mere presence of such neoplasms is an indication for their extirpation. Cook considers that although the pelvis of the nonpregnant woman could be studied by one skilled in the use of the *x*-ray, yet many inaccuracies arise from the distortion of the shadow; and the results cannot be compared with the usual pelvic examination made by a skilled gynecologist. The maternal pelvis could be clearly seen after a pregnancy of 4½ months, but later than this the uterus and its contents formed a veil on the negative. The position and presentation of the child may be determined near the termination of gestation and the *x*-ray might prove of possible value in cases of multiple pregnancy. As to the value of the Röntgen ray as a therapeutic agent in gynecology, Cleaves has recently reported a case in which the Röntgen and ultra-violet rays were employed

¹ Rev. méd. et chi. des Mal. des Femmes, Nov. 25 and Dec. 23, 1896.

² December 6, 1902.

in the treatment of uterine cancer with marked improvement, and Coe has cited a case occurring in the services of Jarman in which a favorable result was obtained in recurrent carcinoma of the cervix. The great difficulty in the treatment of malignant disease of the uterus is the application of the ray to the internal part, and there is probably a legitimate field for invention in the construction of an instrument suited to this purpose. Authorities differ as to the necessity of the direct local application of the ray, and Cleaves believes that the tissues generally in the pelvis should be brought under the influence of the x-ray. [To summarize the present situation, we believe that this method should not supplant

early surgery in malignant disease, but should be used in recurrent cases; and we agree with Coley that the greatest future of this treatment seems to be as a prophylactic agent, to be used immediately after every operation for primary carcinoma.] A. T. Orlof¹ has experimented with electric light in various gynecologic affections. The "cold" white light was employed by means of a specially constructed apparatus. Incandescent lamps furnished the light, its intensity varying from 5 to 16 candle-power. Reserving details for a future report, the author offers these conclusions: Light-treatment is indicated in a series of inflammatory gynecologic conditions, as metritis, parametritis, oophoritis, and salpingitis, in the acute as well as chronic stage; the chief action of light-treatment is striking relief of pain; exudates, serous and

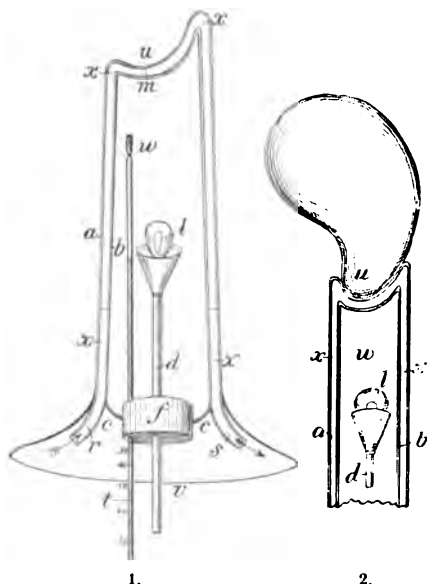


Fig. 67.—1, Horizontal section of speculum: *a, b*, Double tube of isometric glass; *r, s*, test tubes communicating with space *z*, through which cold water flows; *f*, india-rubber cork; *d*, tube for passage of electric wires to incandescent lamp *l*; *t*, thermometer for taking temperature of space *u*. 2, Speculum applied to cervix uteri (Curatulo, in Brit. Med. Jour., Oct. 11, 1902).

purulent, decrease in size and occasionally disappear completely; dysmenorrhea, retroflexion of the uterus, ovarian neuralgia, cervical erosions, and uterine catarrh, especially the gonorrheal variety, are all benefited by the method. On the other hand, light-treatment is contraindicated during menstruation, uterine hemorrhages, and pregnancy. Untoward results, such as general debility and paresthesias, are apt to follow the first 3 or 4 applications. Altogether, in spite of its favorable action, the method needs further investigation. Curatulo² (Rome) has devised a speculum for the application of the electric light to the treatment of diseases of women. The instrument consists of a double cylinder of glass, closed at

¹ Roussky Vrach, Jan. 4, 1903.

² Brit. Med. Jour., Oct. 11, 1902.

the upper end by a cupped, oblique and double septum, furnished with an india-rubber cork, perforated to admit the tube of a suitable Finsen lamp, and also a thermometer. He explains that by the circulation of cold water through the space between the double walls light-effects could be obtained without heat, and by filling the space with fluid containing alum, copper sulfate, or cochineal, the action of the different sorts of rays could be obtained; further, that by using a perforated speculum the light or heat bath could be combined with a douche (Fig. 67).

"Facultative sterility" is the term used by Kock,¹ of the University of Bonn, to designate a new procedure he has devised, and which he recommends for use when it seems necessary to prevent the possibility of conception for any length of time without permanently depriving the subject of procreative power. He forms two folds of mucous membrane, one at the anterior and the other at the posterior lip of the external orifice of the uterus. These act as valves, permitting the outflow of the menstrual fluid and preventing the entrance of the spermatozoa. He uses the word "facultative" because by the removal of the folds fertility may be restored. [Since the days of Sims and his artificial impregnation no procedure has been introduced to the profession which seems quite so original and ingenious as this. It remains to be seen, however, how effective these artificially produced valves will be against the spermatozoa, possessing as they do such remarkable motility. Should they prove effective, the procedure will be of great value in the class of cases in which tubal ligation or exsection has hitherto been practised, and particularly in married women suffering from diseases of the lungs, heart, or kidneys, rendering pregnancy peculiarly perilous.]

The Relation of Gonorrhea to Sterility.—[There has occurred of late a marked reaction in the accepted belief as to the etiology of sterility in women. It was formerly the rule to ascribe the larger percentage of sterile marriages to anteflexion of the uterus with accompanying cervical stenosis; to enforced sterility from the use of shields; to some obscure change resulting from the higher education of women; to syphilitic endometritis; and to some sexual incompatibility between the man and the woman. There is not a shadow of a doubt that all these and other factors not mentioned have a share in the production of sterility in some of its forms. It is now very generally recognized, however, that, while *cherchez la femme* is an excellent adage for one's guidance in many lines of life, it should not overshadow exploration elsewhere on the question of sterility. The extreme importance of gonorrhea in the male in the production of sterility is universally admitted. A very perceptible percentage of unfruitful marriages, which are unjustly attributed to some defect on the part of the woman, results from a double epididymitis with hermetic closure of the tubes, or from an obscure affection of the spermatic tubules resulting in the discharge of deformed or effete spermatozoa. In addition to this male sterility, the result of the action of the gonococcus, the same germ, when introduced into the genital tract of the woman, produces such radical changes in the mucous membranes

¹ Zent. f. Gynäk., No. 37, 1902.

that sterility on the part of the woman is produced. The alkaline leukorrhea that results is inimical to the vitality of the spermatozooids should they be healthy. Again, if the fallopian tubes be involved in the process, the cilia are quickly shed, and by their absence prevent the ingress of the ovum into the uterine fundus. The activity of the pathogenic process also produces such a tumefaction of the tubal walls that the lumen of the tube is obliterated, and hermetic closure follows from adhesive inflammation. Gonorrhea must, therefore, be regarded as a very prolific cause of sterility in the woman and in the man.]

Operations upon the Appendages for Sterility.—[A laparotomy is an operation which always carries with it considerable risk to life, and the question in regard to the advisability of interference simply for the restoration of this function will depend largely upon the urgency of the desire or necessity for offspring, and must be settled according to the exigencies of the individual case.] W. M. Polk¹ reviews a number of instances in which remarkable results have been obtained when previous chronic inflammatory conditions have so changed the ovaries and tubes as to make pregnancy impossible. The operation will undoubtedly become more and more popular as the danger to life decreases. Simply freeing the uterus and appendages when these are bound by adhesions is sometimes sufficient to restore the function. When the ovary is diseased, it should be our aim to leave as much as possible of the normal organ, and it has been found that even a small portion may suffice. If a hydrosalpinx, pyosalpinx, or hematosalpinx exists, it must necessarily be removed, but the cut end may be left free or sutured to the ovary. Everting the opened end and stitching the lining membrane to the outer surface seems necessary when any part of the infundibulum is to remain or when the fimbria have been destroyed. When the entire infundibulum is removed, the pouting mucous membrane appears to be sufficient to insure potency, but even if it should not be, the surface is too minute to tolerate the added irritation of a suture.

Gonorrhea in Women.—Etesse,² in a recently published thesis, studies the effects of the infection of Skene's glands with the gonococcus in causing chronicity of gonorrhea in the female patient. These glands, which are regarded as homologs of the seminal vesicles, are found on each side of and below the vulvar segment of the female urethra, their orifices opening right and left, $\frac{1}{10}$ to $\frac{1}{5}$ of an inch inside the free border of the meatus urinarius. They are almost as frequently infected with the gonorrheal virus as the glands of Bartholin. The infection of these glands may happen primarily, but generally it is caused by the gonorrheal discharge bathing the parts around the meatus urinarius in cases of urethritis in the female. The disease is generally chronic, rarely acute, and causes no subjective symptoms, so that the surgeon must seek for it, as his attention will not be called to it by the patient. Once ensconced in Skene's glands, the gonococcus may cause repeated infections of the patient's urethra, as well as proving the occasion of numerous attacks of gonorrhea among her male visitors. In Etesse's opinion the

¹ Med. Rec., Dec. 6, 1902.

² Canad. Jour. of Med. and Surg., Sept., 1902.

only efficacious treatment is destruction of the glands of Skene in the patient by the use of the galvanocautery, as ordinary topical treatment yields only uncertain results. P. Michin¹ has made an exceedingly interesting study of the presence of trimethylamin in the normal vaginal secretion. This substance is universally found in the vaginal mucus, though the quantity varies with the general nutrition and the local conditions. It was found diminished in cases which had been operated upon at the period of the climacteric, and also in emaciated patients. An acute inflammation of the genital tract also diminished it. The tests were made by taking one gram of dry cotton and passing it over the mucous membrane. When it had taken up sufficient mucus, it was weighed, the mucus was dissolved in distilled water, and the chemical test was applied to the resulting opalescent fluid. The substance was found to have distinct bactericidal power, it preventing or inhibiting the growth of the staphylococci, typhoid bacillus, bacterium coli, and proteus vulgaris. In all, the writer has examined 154 cases in reference to the presence of this substance in the vaginal mucus.

The Yeast-treatment of Gonorrhea in Women.—[A curious and interesting revival in the arena of modern practical therapeutics of a treatment practised by Hippocrates and Dioscorides is afforded by this mode of therapy. Rediscovered by Landau in 1899, the method has recently received at the hands of Otto Abraham² a critical overhauling.] He studied the subject, apparently with great care, from the chemical, bacteriologic, and clinical standpoints, and it would seem as though the yeast-treatment might not unlikely take a permanent place in therapeutics. Chemically, after numerous experiments, Abraham found the most active form of yeast to be the living cells plus asparagin. Bacteriologically, too, he found that this combination exerted the maximum effect in destroying gonococci in cultures of gonococcal vaginal mucus. Clinically, 40 patients were examined who presented the following conditions: Acute vulvitis, 9 times; urethritis, 3; bartholinitis, 3; colpitis, 10; erosions of the portio, 12; endometritis cervicis blenorrhoica, 34; and endometritis corporis blenorrhoica, 3. Vulvitis, colpitis, and erosions were the conditions most rapidly influenced; after one or two days the pruritus and burning lessened, the flow became clearer and lost its purulent character, and after a few days vanished. Even dollar-sized erosions healed in 4 to 8 days on an average. Two cases of bartholinitis required incision; the other subsided without it. Urethritis was entirely uninfluenced. Of the 34 patients with endometritis cervicis, 30 were completely cured within 5 to 23 days. The flow shortly became clearer and thinner; in the first days it increased in quantity, then rapidly subsided. Of the 3 cases of endometritis corporis, one was entirely cured, which shows the possibility of influencing the body of the uterus from the vagina, at least with yeast, which may, so to speak, multiply its way in. Of the 6 refractory cases of endometritis (cervicis 4, corporis 2), 3 were afterward cured by the insertion of a "pencil," consisting

¹ Shurnal akuscherstwa i shenskikh bolsnei, 1902, Nos. 7 and 8.

² Monats. f. Geburts. u. Gynäk., Dec., 1902.

of yeast, asparagin, and gelatin, into the cervical canal. In all the cases, even those last mentioned, the treatment was effected without any unpleasant results or any untoward reaction; only 2 patients complaining of slight itching during the first days. The patients were examined for gonococci before, during, and after treatment. Of the 40, 28 showed gonococci before treatment; after it the most careful search failed to detect any. Other cocci and bacteria in the vaginal mucus, staining with Gram's method, decreased in number and colorability. The gonococcicidal action of the yeast is chemical, and due to an enzyme. The yeast-cells do not live long in the vagina; 3 days after the discontinuance of treatment they could no longer be found. Whereas former observers have used the yeast by injections of fluids containing it, Abraham introduced a decided improvement by employing a suppository of yeast, asparagin, and gelatin; and in the case of cervix uteri, a "pencil" of the same ingredients, but of firmer consistence. A suppository is inserted at night and the napkin put on, and in the morning the vagina is syringed out.

AFFECTIONS OF THE VULVA, VAGINA, RECTUM, AND BREAST.

Kraurosis Vulvæ with Rodent Ulcer.—Kreis¹ reports a case of kraurosis vulvæ complicated by "rodent ulcer," a combination which, though rare, is too frequent to be merely coincident. A woman, aged 42, entered the hospital in June, 1901. She had been married since 1884, had had 4 children at term, the perineum being ruptured on each occasion, and one abortion. Menstruation was regular. She had suffered from pruritus vulvæ for years. Four years before admission a wart was excised from the left labium majus, but 2½ years later a fresh wart appeared to the left of the clitoris; this had recently rapidly enlarged, and caused pain and excoriation. An ulcer formed below the wart, and steadily increased in size. The pruritus was also intensified. Nothing abnormal could be found in any organ except the vulva, and the urine contained neither sugar nor albumin. The external genitals were greatly atrophied, and the pubic hairs were scanty. The clitoris had disappeared entirely, except for a trace of the prepuce, and the nymphæ were absent. The whole introitus was greatly narrowed, and of a whitish color. The skin was fissured, inelastic, and covered on the inner side with small, shallow ulcers. The ulcer beneath the wart was of about the size of a sixpenny piece; the surface was red and smooth, and the base indurated. There was a hard gland of the size of an almond in the left groin, but nothing could be felt in the right. The internal genitals were normal. The ulcer with the wart and a portion of the altered kraurotic skin was excised, after its malignant character had been determined microscopically, and the wound was closed by catgut sutures. The enlarged inguinal gland was also removed. Both wounds healed by first intention. Microscopically the changes in the kraurotic skin consisted in consider-

¹ Corr.-Bl. f. Schweiz. Aertze, Jan. 1, 1902.

able narrowing of the epithelial layer, especially of the rete Malpighii, with complete absence of sweat and sebaceous glands. Near the ulcer the epidermis became thicker and was separated from the corium by dense masses of round cells. The ulcer was composed of solid epithelial processes which had invaded the corium. Mitosis was everywhere marked. The most superficial layer of epithelium was absent. It was, therefore, a typical cutaneous carcinoma or rodent ulcer. The structure of the wart was that of a benign papilloma. The excised inguinal gland contained one suspicious focus. On October 2 the woman was readmitted with an inguinal gland of the size of a pigeon's egg on the right side, and an excoriation on the skin just below the former position of the clitoris. The gland and the suspicious skin were excised. The structure of the former was typically carcinomatous, that of the latter typically kraurotic. The writer agrees with those who assume that in kraurosis the stage of atrophy and contraction is preceded by hypertrophy and hyperplasia, and that the process is of an inflammatory nature. The frequent history of long-continued pruritus makes a causal connection between it and kraurosis probable. The patient in this case had constantly washed the ulcer with a decoction of *herba equiseti*, and afterward with a strong solution of alum, and the resulting irritation possibly produced malignant degeneration of an originally simple ulcer. [The case shows that, in kraurosis, fragments of suspicious ulcers should be removed for microscopic examination, as malignancy cannot be determined early clinically, and also that if malignant degeneration has occurred the inguinal glands should be dissected out on either side whether they are palpable or not.]

Pruritus Vulvæ and Allied Conditions.—[While this affection is not, strictly speaking, a disease, but only a symptom of a disease, it is, like diarrhea, a symptom of such overwhelming importance that it overshadows the original disease and becomes the point of attack.] E. H. Balloch¹ defines it as a hyperesthesia of the nerves of the vulva leading to and accompanied by an intense itching. Beginning as a slight irritation, it produces an irresistible desire to scratch the affected parts. This procedure naturally leads to increased inflammation, making the itching more intense than ever. Thus is established a vicious circle, the final result in severe cases being that the very existence of the unfortunate patient is rendered miserable and that life itself becomes a burden to the worn and despondent woman. Fortunately the itching is not always so severe or constant. It may be intermittent, coming on when the patient is overheated from any cause, or presenting itself, for instance, at the menstrual period only. In some reported cases it was a symptom accompanying pregnancy. A common type is a form which comes on at night. This type was present in one of the author's patients and was so severe that it interfered with sleep. The cases of pruritus may be grouped under 3 general heads: (1) The contact of irritating discharges. Among these may be mentioned as specially important, leukorrhea, hydrorrhea, diabetes, dribbling of the urine from any cause, urethritis,

¹ Am. Jour. Obstet., May, 1903.

and the discharges from malignant disease of the uterus or neighboring organs. (2) Local derangement of the vulva, such as vulvitis, aphthæ, vulvar eruptions, animal parasites, vegetations, urethral caruncle, and the growth on the vulva of short bristly hairs. (3) General diseases of the nervous system or those diseases leading to debility of the system. One of the most interesting diseases of this region, in which pruritus is the chief and initial symptom, is that known as kraurosis vulvæ, first described by Breisky. The alternation of atrophy and hypertrophy is characteristic of the disease. No disease of the nerves has as yet been discovered. There is a patchy hyaline degeneration of the tissues beneath the epidermis, especially in the elastic tissues. The treatment of pruritus resolves itself into a search for its cause in the disease that it accompanies and an effort to remedy it. The uterus should be examined and any discharge, however slight it may be, should be remedied by curettage or otherwise. The urine should, of course, be examined for sugar, in view of the fact that many cases are associated with diabetes. In this connection, attention should be paid to the bladder and urethra and any dribbling of the urine corrected. Any disease of the liver or digestive apparatus should be regulated by dietary restrictions. As to local treatment, suffice it to say that every powder, salve, or lotion that has ever been suspected of having antipruritic properties has at one time or other been used or suggested for this disease, with a result that our pruritic patients still continue to scratch. The success obtained in kraurosis by excision has led the author to advise this procedure in cases of simple pruritus, where, after a reasonable time, the application of the usual remedies do not prove to be efficacious. According to B. C. Hirst,¹ the treatment of idiopathic pruritus vulvæ is one of the unsolved problems of gynecology. Hirst believes that surgical intervention promises better results than any other line of treatment so far suggested. It is too early, as yet, to decide as to the value of nerve-resection. Apart from the question of the cure of the condition by nerve-destruction, one must carefully weigh the possible consequences. There is reason for believing that atrophic changes may take place and be followed by kraurosis vulvæ, and possibly also the operative intervention may favor the development of epithelioma of the external genitals. The author describes his method of exsecting the necessary nerves and gives the report of one operation. Hirst concludes his paper with the following queries: "(1) Which is the better of the two surgical treatments of pruritus vulvæ, exsection of the affected skin, or resection of the sensory nerve-supply? (2) What is the best surgical technic for isolating and resecting the sensory nerves supplying the vulva? (3) What has been the permanent result of this operative procedure in the experience of the members who have performed it or have had the opportunity of watching cases afterward? (4) If a cure of pruritus can be expected, is there a likelihood, or has any one clinical evidence to present, of the development of kraurosis vulvæ, and possibly of an associated epithelioma?"

¹ Amer. Med., May 16, 1903.

Mycosis Vaginæ.—A. J. Smith and O. H. Radkey¹ report a case of this rare disease. The condition may be found well outlined in the older writings, being described as especially liable to occur in the course of pregnancy, particularly in women having patulous vaginas, as being of comparatively sudden occurrence, accompanied by considerable pain, intense burning and pruritus and attended with an intensely acid vaginal discharge, in which more or less blood-discoloration is apt to be present. The appearance of the vaginal wall is described much as is detailed in the present paper, the aphthous patches being sometimes of the ordinary appearances of those in thrush of the mouth, but sometimes as grayish or somewhat darker, slightly elevated points of a mucous or gelatinous appearance, leaving a raw base on removal, with the intervening mucous

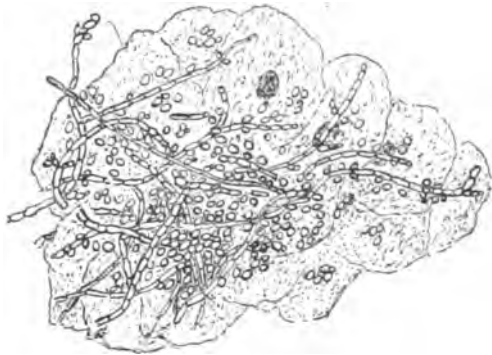


Fig. 68.—A group of vaginal epithelial cells, overlaid by mycelial threads and conidia of *Oidium albicans* (Smith and Radkey, in *Med. News*, June 27, 1903).

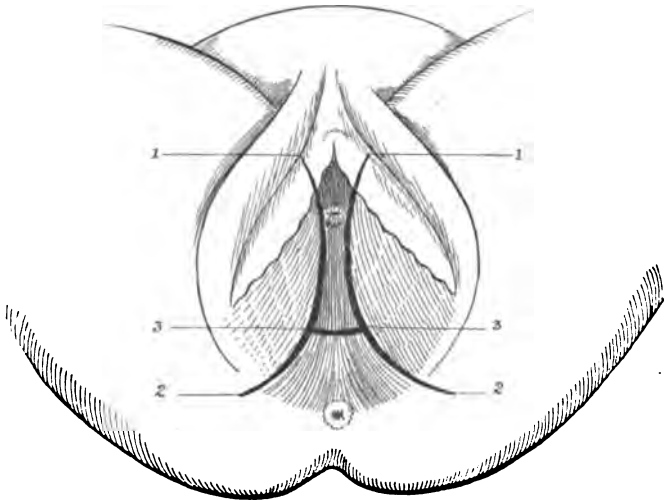


Fig. 69.—Anderson's case of congenital absence of the vagina. Lines of incision for making an artificial vagina (*Pacific Med. Jour.*, Feb., 1903).

membrane sometimes normal and at other times red, angry, and swollen (Fig. 68). It is best treated by vigorous applications of mercuric chlorid solution.

¹ *Med. News*, June 27, 1903.

Congenital Absence of the Vagina.—W. Anderson¹ reports a case of complete congenital absence of the vagina in a woman 20 years of age (Plate 4). The vesical and rectal walls were separated by only $\frac{1}{4}$ of an inch of tissue. On the right side near the brim of the pelvis was found an oblong semisolid enlargement, evidently a partially developed unicorn uterus. At the corresponding site on the left side no organ could be found. Extending outward and upward to the right could be felt a cord-like fallopian tube. Near the outer extremity was found a small enlargement, evidently a rudimentary ovary. On the left side a small cord-like fallopian tube could be determined with an ovary attached. The operation for the restoration of the vagina was begun by an incision through the labia minora, near the clitoris on each side.

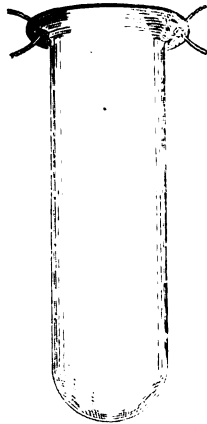


Fig. 70.—Glass plug used in operation for artificial vagina (Anderson, in *Pacific Med. Jour.*, Feb., 1903).

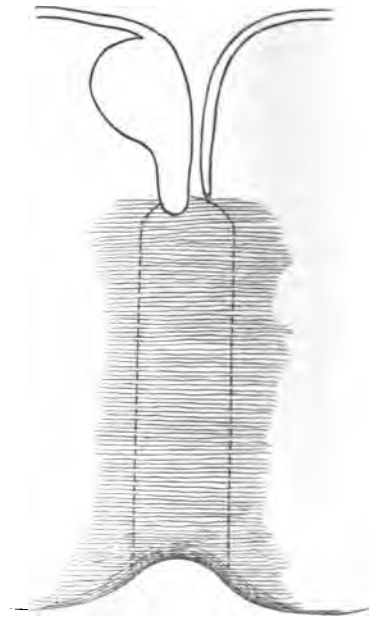
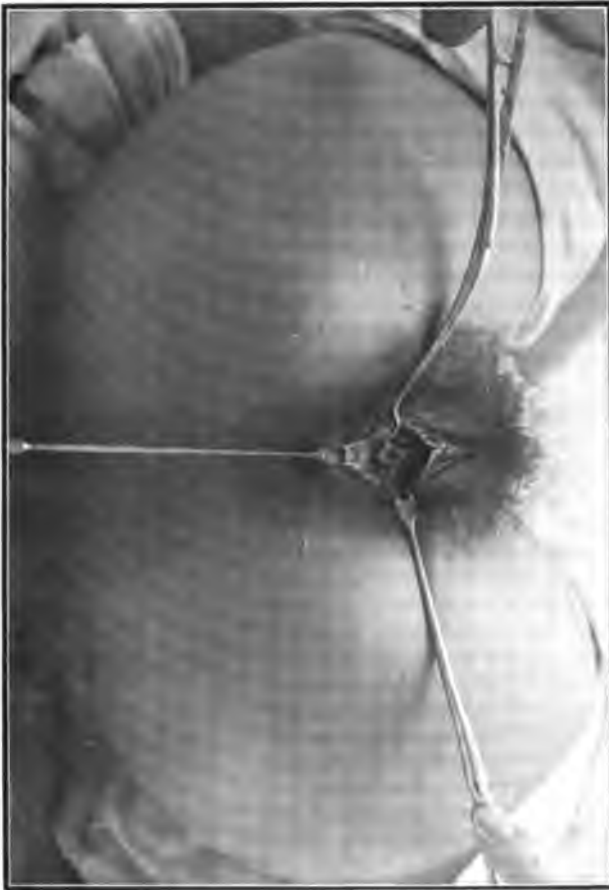


Fig. 71.—Shows the artificial vagina carried up to the single horn of the partially developed right müllerian duct, which was found to be impervious (Anderson, in *Pacific Med. Jour.*, Feb., 1903).

This was extended down to a point below the insertion of the nymphæ (2, 2, Fig. 69). The mucous membrane of the reduplication of each labium minor was dissected up so as to form a long flap for transplantation into the sides of the artificial vagina. A cross-section (3, 3, Fig. 69) was made along the free margin of the fold of hymen attached posteriorly, using the internal flap and the mucous membrane below the meatus for the anterior wall, and the outer half of the hymenial fold with the membrane extending toward the rectum for the posterior flap of the vagina. An incision was then made from the

¹ *Pacific Med. Jour.*, Feb., 1903.

PLATE 4.



Anderson's case of congenital absence of the vagina (Pacific Med. Jour., Feb., 1903).

insertion of one labium minor to the other midway between the urethra and the rectum. A large male sound was held in the bladder with the convexity against the rectal wall, and the finger of an assistant was kept in the rectum against the sound in the bladder. The thin septum between the bladder and the rectum was then separated by blunt dissection until a canal was made measuring $3\frac{3}{4}$ inches in length by $1\frac{1}{2}$ inches in width. The mucous membrane obtained from extending the folds of the labia minora was then sewed into the cavity as far up as it would stretch on each side. The anterior and posterior flaps were then united to the walls of the cavity thus formed. The mucous membrane reached to a depth of 3 inches. In the after-treatment a glass plug was introduced having a diameter of $1\frac{1}{4}$ inches and a length of 4 inches (Fig. 70). Douches of 1 : 5000 potassium permanganate were employed daily. The artificial vagina was carried up to the single horn of the partially developed right müllerian duct, which was found to be impervious (Fig. 71). Anderson writes: "I examined the patient a few days ago,—October 26, 1903,—over 9 months after the operation. The artificial vagina was found to be in a healthy state. It measures a little less than 3 inches and had a smaller diameter at the apex than at the vulva, otherwise it was in perfect condition. The patient's general health had improved materially. She had gained in weight and was very happy to think that she had no apparent malformation and could get married now. The rudimentary uterus and ovaries had not changed to any appreciable extent. There had been no attempt to menstruate. She had occasional headaches and 'flushes,' but she thought they were decreasing in severity and frequency. She came to consult me about getting married in about 2 months. I told her she could do so if she would explain to her fiancé what had been done and that she could never become a mother. This she promised to do. I also cautioned her to be careful about her marital relations for some time until her artificial vagina became accustomed to its new functions."

Cystocele.—Barton Cooke Hirst¹ has devised a new operation for cystocele which will immediately appeal to the practical mind as a method offering several advantages over the usual technic. He reminds us that the injuries of the cervix, pelvic floor, and perineum, and the operations which satisfactorily repair them, are quite well known and definite, but the same can scarcely be said of the anterior vaginal wall. There are two kinds of injury inflicted in this region by the passage of the child's head; first, the anterior wall, thrown into transverse rugæ, is nipped between the child's head and the symphysis, is pushed downward and outward, and is torn loose from its subjacent connections in the manner that a glacier pushes ahead of the moraine. Second, there is laceration of the muscle of the urogenital trigonum in the anterior sulci, just as the levator ani muscle is torn in the posterior sulci. Any one who thoroughly studies Waldeyer's recent publication on pelvic anatomy must be convinced that the strongest support of the anterior vaginal wall is the transverse muscle running from the junction of the ischium and pubis, across

¹ New Orleans M. and S. Jour., Oct., 1902.

the lower anterior portion of the pelvic cavity, and actually inserted in the vaginal wall—the only muscle that is inserted in the vagina itself. This muscle runs across the anterior sulci of the vagina, and is frequently torn through in labor, usually on the left side. In over 20 cases Hirst has performed the following operation: The anterior vaginal sulcus is displayed by 3 bullet-forceps, making traction at 3 angles of the sulcus. As the woman lies in the dorsal position, on the table, the sulcus is not easily accessible and cannot conveniently be denuded, as it lies hidden within the vagina; but by fixing one bullet-forceps alongside the orifice of the urethra, the other one in the opposite vaginal wall, and the third half-way up the vaginal wall at the apex of the sulcus, the triangular area involved in the injury comes plainly to view. The triangle is marked out with a knife, and the mucous membrane is readily dissected off by scissors in one piece, which takes but a minute or two. The other side is treated in a similar manner. Usually the tear is deeper on the left side and may be confined to that side. The sulcus being denuded, the sutures of silkworm-gut are inserted just as they are in the posterior sulci in an Emmet operation. They are not yet united, but clipped temporarily with hemostats. The cervix is pulled out of the vulva and the rest of the operation is performed in the usual manner for cystocele, with an oval denudation and the buried continuous tier suture of catgut. After the closure of the oval denudation the sulci sutures are united with shot. Hirst calls attention to the importance of repairing the posterior wall, without which any anterior operation is doubtful. It will take some years to determine the real effects of the operation, but he has reason to hope that some such operation as this will solve the problem of repair of the injuries to the anterior vaginal wall as satisfactorily as that problem has been solved in injuries of the cervix and of the posterior vaginal wall and pelvic floor.

The Glands in Cancer of the Breast.—Ozenne¹ was able to keep 23 cases of cancer of the breast under observation from 2 to 5 years. In 11 cases the breast alone was removed, as the glands showed no evidence of being involved. In one instance, in which the patient lived for 10 years after operation, an enormous enlargement of one of the retropectoral glands was not disturbed, as it was regarded as purely inflammatory—in fact, it disappeared spontaneously. Twelve patients from whom the axillary glands were removed at the same time with the breast had a recurrence within a year after operation. The writer refrained from removing the axillary glands in 9 subsequent cases, with the result that 2 patients are now alive 4 years after operation, and 5 lived from 2 to 3½ years. The writer infers that the results after these partial operations are quite as satisfactory as after the radical ones. While the principle of complete extirpation is theoretically ideal, he does not think that the results have shown that the hopes of a permanent cure have been realized. He is even inclined to believe that the extensive removal of glands may favor the spread of the disease to distant parts of the body.

¹ Rev. prat. Obstét. et de Gynec., 1901, No. 11.

PERINEORRHAPHY.

The Pelvic Floor.—[An accurate knowledge of the structures comprising the pelvic floor is most essential in order that a perfect repair of the lacerated structure may be made.] J. H. Burtenshaw¹ gives a concise anatomic description as follows: Remove the skin, fascia, and certain muscular structures over the area bounded by the pubes, the ischial rami, and the coccyx, and a portion of the levator ani will be exposed to view, a more or less apron-like muscle when seen from this position, which encircles the urethral, vaginal, and rectal orifices. This is shown in Fig. 72, the superficial layer of the triangular ligament (see Fig. 74) having been removed. The levator ani on each side is attached to the horizontal

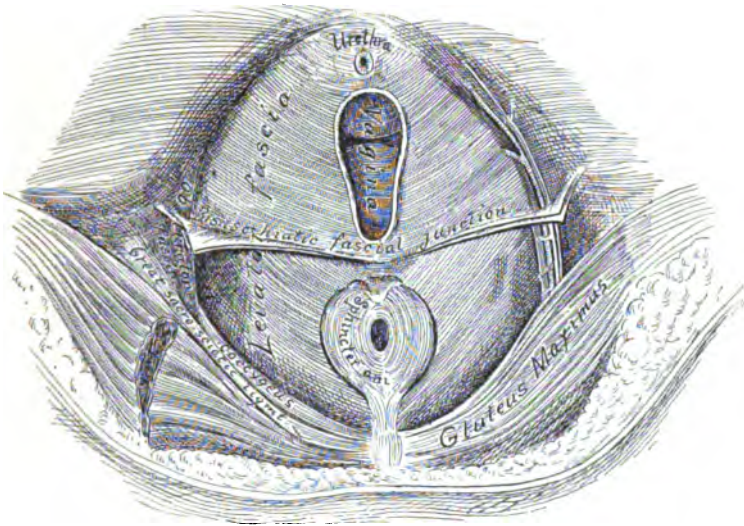


Fig. 72.—The levator ani muscle, covered by its fascia, as seen from below (Weisse) (Burtenshaw, in N. Y. Med. Jour., Jan. 10, 1903).

ramus of the os pubis, to the inner side of the spine of the ischium, and the fascia extending between those points (Fig. 73). The insertions of the muscle are many. "Stretching down and back, the fibers divide into unequal portions, of which one passes to the anterior aspect of the rectum, another to its posterior and lateral surfaces, while the fibers attached to the pubic bone extend along the vagina, with which they are united by strong connective tissue, but do not terminate within its walls. The belly of the muscle sweeps backward, almost horizontally, surrounding the rectum" (Piersol). In Fig. 73 these points of attachment are particularly well shown. It would seem that this dissection should convince those who are averse to attributing sustaining function to the pelvic floor that every anatomic detail of the parts tends to uphold the theory.

¹ N. Y. Med. Jour., Jan. 10, 1903.

Of very great importance is the fascia which covers the several portions of the levator and enters largely into the structure of the pelvic floor. Without entering into details, it may be said that the posterior or outer aspect of the muscle is covered, from the rami of the pubes to the ischia and coccyx, by a dense fascia, the levator, which, a short distance above the external and sphincter, unites with the deep layer of the triangular ligament (Figs. 72 and 74). The rectovesical fascia (Fig. 74) Burtenshaw considers the most important fascia of the pelvis, as it undoubtedly is the prime factor in enabling the pelvic floor to withstand intraabdominal pressure at the pelvic outlet. It has its origin from the parietal or main layer of the pelvic fascia along the so-called "white line," which extends from the lower part of the posterior surface of the symphysis to the spine of the ischium, and covers the inner or upper surface of the levator ani as far as the rectum, where it divides into 4 layers—the vesical, the vesicovaginal, the rectovaginal, and the rectal. Of these, the rectovagi-



Fig. 73.—The attachments of the levator ani muscle to the pelvis, showing the role of this muscle in supporting the pelvic viscera (Dickinson) (Burtenshaw, in *N. Y. Med. Jour.*, Jan. 10, 1903).

nal covers the fibers of the levator which pass between the vagina and lower part of the rectum, while the rectal layer extends behind the rectum and is attached to its walls.

In performing perineorrhaphy, A. B. Tucker¹ suggests passing the sutures through the mucous membrane of the vagina out to, but not through the skin, so as to get the **greatest point of resistance within the vagina**, and thus restore to its normal place the already protruding perineal floor. Starting at the caruncle on the left side, the mucous membrane is split with blunt scissors from the skin at their junction, and this flap is dissected with the point of the scissors closed until it is possible to grasp it with a pair of artery-forceps midway between the two caruncles. The scissors are then pushed up to the highest point of the rectocele, and opened to the full extent. The dissection is then completed from without inward with the finger, holding the flap between the forefinger and the thumb. The flap is next

¹ *Virginia Med. Semi-Monthly*, Dec. 26, 1902.

cut out from the caruncles, completely removing it. This leaves a somewhat triangular denuded surface, the base of which is formed by the skin from caruncle to caruncle and the apex, the highest point of the rectocele, with a sulcus midway between the caruncle and apex. A Hagedorn needle, threaded with silkworm-gut, is passed through the vaginal mucous membrane midway between the sulcus and the apex on the left side, and as soon as the needle is through the mucous membrane it is passed well beneath the mucous membrane outward and downward around the sulcus, then downward and outward through the denuded tissue and down through the sphincter muscle. The needle is then

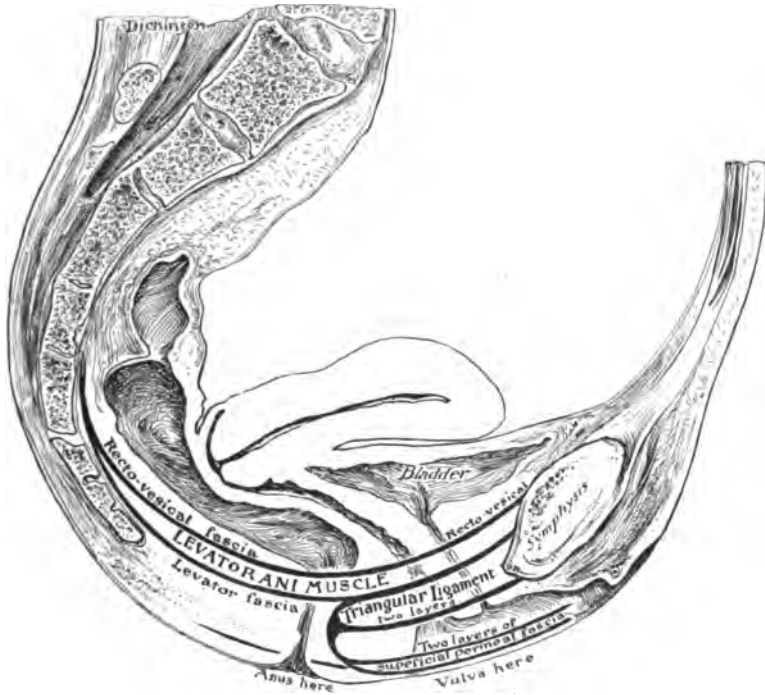


Fig. 74.—Mesial section showing the levator ani muscle and its enveloping fascia (Dickinson) (Burtenshaw, in N. Y. Med. Jour., Jan. 10, 1903).

turned upward and inward, and is brought out in the median line through the denuded tissue. The suture is pulled well through and, catching the distal end of the suture with a pair of artery-forceps to prevent its being drawn entirely through, the needle is passed in at the point of exit and is carried well outward and downward, and then upward, and is brought out through the mucous membrane at a point corresponding to its entrance on the other side. The second and last deep suture is carried through the mucous membrane midway between the other suture and the apex and carried downward and inward until it comes out in the median line, $\frac{1}{2}$ of an inch above the skin. The needle

is then introduced at the point of exit until it comes upward and outward at a point corresponding to its entrance. On drawing these sutures together the tissues are brought inward and toward each other in the median line. With a cervix-needle and catgut a superficial continuous suture down to the second suture is introduced near to the apex, and tied, and then a superficial line of sutures is carried on until all of the edges of the mucous membrane are brought together and all denuded surfaces covered. After the operation the patient is allowed to urinate without catheterization, if possible, and the bowels are moved after the first twenty-four hours. The stitches are removed at the end of a week and the patient is then allowed to sit up.

CONDITIONS OF THE CERVIX UTERI.

Laceration of the Uterine Cervix.—Bushong¹ thinks that a large proportion of uterine lacerations can be cured without operation, and continued experience has led him to advise operation in a smaller percentage of cases each year. The great advantage of cure by local treatment is that the cervix has absolutely no cicatricial tissue left in it. In all but recent lacerations an area of hard cicatricial tissue is found under and



Fig. 75.—Ramsay's uterine dilator.

around the torn surfaces, which acts as a foreign body and causes distressing symptoms. The complete removal of this tissue is the key to successful treatment. Several drugs possess the power of promoting the absorption and removal of this hard structure, but Bushong has found Monsel's solution the best. After all discharges have been removed and the vagina thoroughly cleansed, Monsel's solution is liberally applied to the cervix and vault of the vagina, the part over the scars being flooded with it and a tampon introduced to prevent the escape of the medicine. The tampon should be withdrawn on the evening after treatment. The application may be made about every 5 days, and meanwhile there should be copious douches of warm or hot water, and a free bowel-movement daily. If there is an erosion of the cervix, the best remedy is a combination of pure tincture of iodine and beechwood creasote. Bathe the surface in this before using Monsel's solution. When there is no cicatricial tissue, the iron is omitted.

A New Form of Dilator for the Cervix Uteri.—The illustration (Fig. 75) shows a new form of uterine dilator, which has been made at the suggestion of F. Winson Ramsay,² of Bournemouth, and for which the following advantages are claimed: (1) Being an open tube, no pressure is exerted in front of the dilator, and therefore any blood or discharge flows down the tube instead of being forced onward and into the

¹ Med. News, Nov. 15, 1902.

² Quarterly Med. Jour., Nov., 1902.

fallopian tubes (probably the commonest cause of trouble after curetage); (2) the measurements on the dilator (a grooved ring at the normal uterine length and a boss at one inch distance), both of which can be felt with the finger, enable the operator to always know how far the instrument is inserted, while the length of the uterus having been measured by the first size, he knows how far he can insert the dilator with safety; (3) the shape of the handle, which fits comfortably into the palm, and is steadied and rotation prevented by the pressure of the middle finger on the depression below the handle; (4) the dilators are made in 16 sizes, $\frac{3}{8}$ to $\frac{1}{2}$ inch, representing millimeters in diameter. A series of 8 alternate sizes forms a useful set for general use; the sizes are marked in large numerals on the upper surface of the handles, making selection easy.

UTERINE ANOMALIES OF DEVELOPMENT.

Congenital Absence of the Uterus.—W. A. N. Dorland¹ reports 4 cases of congenital absence of the womb and remarks that the etiology of such conditions must necessarily be more or less obscure. It is generally admitted as beyond controversy that both the uterus and fallopian tubes are derived from the embryonic müllerian ducts. Williams states that "according to His, the first signs of their development can be noted in embryos having a body-length of from 7 to 7.5 mm., when a thickening may be noticed in the celomic epithelium on the outer margin of each wolffian body. These gradually become converted into two epithelial ducts, which converge and eventually meet together in the middle line, terminating in the urogenital sinus. The müllerian ducts reach the urogenital sinus in embryos having a body-length of 2.5 to 3.5 cm. Their upper ends form the fallopian tubes, while their lower portions fuse together to form the uterus and vagina. The fusion of the müllerian ducts is usually completed at about the third month, though the point at which the process is to occur is indicated at a much earlier period by the position of the round ligament." It is plainly to be seen, then, that owing to their distinct origin ovaries may be present in the absence of the uterus and vagina, and patients suffering from this curious defect may present all the menstrual phenomena, including ovarian dysmenorrhea, backache, and general malaise, as well as possess a certain amount of the genital sense. Nothing definite is known as to what factors are at work in the early weeks of gestation to prevent the development of these ducts and their ultimate fusion. An interesting theory has been recently advanced by Ballantyne, who would claim that all congenital anomalies, such as absence or rudimentary development of organs, or double formations, all of which are arrestments of normal embryologic processes or disturbances of embryogenesis, are brought about by the action of traumatism, microbes, or toxins upon the embryo in utero. While this has not been absolutely demonstrated, it is a very plausible theory, and one which may be accepted until controverted or supplanted by a better. Be this as it

¹ Am. Gynec., April, 1903.

may, it remains true that the variety of the congenital defect will depend upon the time in embryogenesis at which the disturbing factor becomes operative. Most commonly, judging from the comparative frequency of the varieties, this occurs late in embryonic life, after the ducts of Müller have attained their full maturity, but prior to the time at which they have fully coalesced to form the generative organs. The various forms of double uteri and vagina are thus evolved. If, however, the arrest of development occur prior to the formation of the uterus by fusion of these ducts, or prior to the development of the ducts of Müller themselves, either one or both of these structures fail to appear; in the former instance there results a uterus unicornis, or one formed by but a single müllerian duct; in the latter case no trace of the uterus can be detected on manipulation, even when the patient is completely relaxed under the influence of an anesthetic. If, however, the pelvic cavities of such individuals could be examined carefully after death, it is not improbable that in almost all, if not in every case, some trace of the missing structures could be detected, microscopically if not macroscopically, in the form of fragments of rudimentary muscular tissue.

FISTULAS.

Apparatus for Urinary Fistula.—No matter what the type of false passage may be through which urine reaches the surface, the patient is in a pitiable condition. A. Holowko¹ presented the following notes on a simple means of receiving and disposing of the urine in cases of urinary fistula. He stated that such patients presented themselves frequently at a hospital in such a condition that an immediate operation could not be undertaken. Such conditions are classed by Fritsch, in Veit's "Handbuch der Gynäkologie," under the following: Pus-processes of any kind about the genital apparatus, ordinary uncleanness, boils and pustules, and any other condition involving uncleanness. All such patients must first be freed from all possible contamination, and as a rule many of them require to be "fed up," so that they will endure the operation without too much shock. One obstacle against the successful accomplishment of these necessary aims is that many of these patients cannot be kept in the ordinary hospital the necessary length of time, both from the standpoint of the institution and themselves. Oftentimes, with the greatest endeavor at cleanliness, baths, and various rubber machines for receiving the urine, the urine changes sufficiently in the air to render the patient and his surroundings very uncomfortable. In order to correct the evils of this situation, to receive the urine safely and carry it off, he feels that he has devised a simple means, consisting of the following: An ordinary air-cushion is provided with a rubber bottom stretching across the ordinary open space, and in the middle of this a large rubber tube is attached. In order to make this device durable he has caused it to be made of strong fabric, because pure rubber is ordinarily not suitable for it. This air-cushion is then laid on the

¹ Z'blatt. f. Gynäk., 1902, No. 30.

mattress, and the tube attached to it is passed through a hole in the mattress and then into a bottle, which contains the usual antiseptic fluid, preferably some solution of formalin. The one disadvantage of this apparatus is that the floor of the cushion often becomes irregular and kinked, especially around the tube, so that the urine instead of flowing off collects in it. To avoid this he has placed a metal connection-tube, incorporated in the floor of the cushion, to which the rubber tube is attached in such a manner as to prevent these difficulties. He has used this device in his private hospital and finds that the majority of patients are more satisfied with it than with any other means. As a rule they remain quite dry, and the mucous membrane of the genital organs, which usually is so much diseased by the fistula, is given an opportunity to heal so that the operation can be done under the most favorable circumstances.

Vesicovaginal Fistula.—Drew¹ devised an ingenious method for closing a vesicovaginal fistula, $\frac{1}{2}$ inch in diameter, due to the ulceration caused by a Zwanck pessary, and situated at the junction of the cervix with the anterior vaginal wall. An incision was made in the median line of the anterior vaginal wall from close to the urethral orifice to the margin of the fistulous opening; this incision was prolonged around the margin of the fistula. The vagina was then carefully separated from the bladder, and the two flaps thus made were drawn aside. A U-shaped flap of mucous membrane was dissected from the anterior lip of the cervix and accurately sutured, by Lembert's method, to the margins of the fistula. The vaginal flaps were united in the middle line and their upper margins sutured to the raw surface on the cervix. The fistula was permanently closed, and the vaginal wound healed well. McCann² says that in closing an opening in any hollow viscus two important surgical principles must be borne in mind: to avoid all tension on the stitches; and to avoid passing the suture-material through the inner lining of the viscus. Hence in operating for vesicovaginal fistula the principle to be adopted should be a free separation of the bladder from the uterus and vaginal wall in order to remove all tension, and separate suturing of the opening in the bladder with Lembert's sutures. The bladder-sutures are inserted transversely while the vaginal walls are stitched in a longitudinal direction. McCann has abandoned silk sutures for this operation and prefers properly sterilized chromicized catgut. He does not use a self-retaining catheter which may produce cystitis, but prefers using a catheter at regular intervals until the patient can pass the urine naturally. He has adopted this method of free separation of the bladder in the treatment of ureterovaginal fistula, thus bringing the separated bladder toward the fixed end of the ureter, and implanting the latter into a new opening made in the bladder.

¹ Brit. Med. Jour., 1902, No. 2159.

² Brit. Med. Jour., May 17, 1902.

THE URINARY ORGANS.

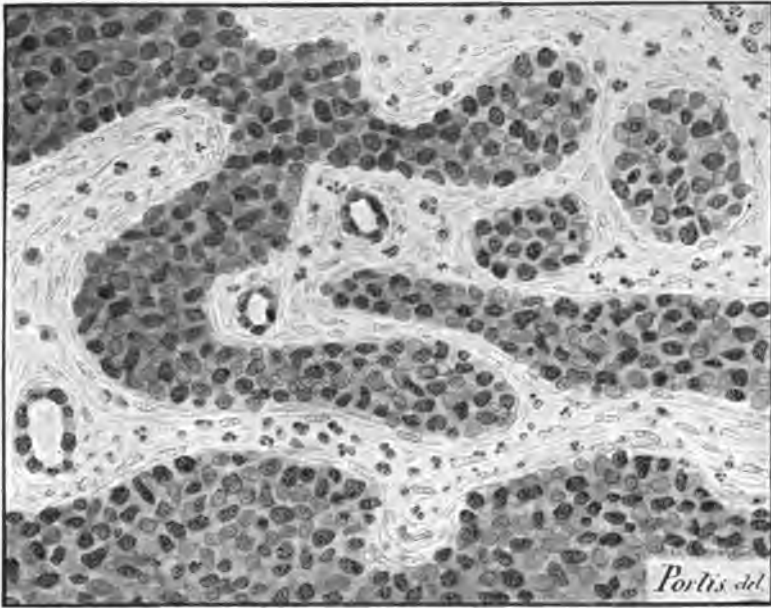
The Pathology of Skene's Glands.—[In 1880 Skene contributed a paper on the anatomy and pathology of two important glands of the female urethra. It will be remembered that the mucous membrane of the female urethra, when not distended, forms longitudinal folds. It has many depressions and blind canals, and near its floor, just inside the meatus, are found the two urethral ducts described by Skene. They admit a No. 1 probe of the French scale and extend upward, parallel to the long axis of the urethra, for $\frac{3}{8}$ to $\frac{1}{2}$ of an inch in the muscular tissue beneath the mucous membrane. The mouths of these tubules are found about $\frac{1}{8}$ inch from the meatus, and, if the mucous membrane is everted, these openings are exposed to view on either side of the entrance to the urethra.] Kelly,¹ in an address before the Philadelphia Obstetrical Society, December 4, 1902, discussed the functions and pathology of these glands. He believes that their function is to moisten the urethral labia, particularly during coitus, during the violent displacement of the labia up into the vagina, when they need constant lubrication to obviate the injurious effects of attrition; in this way they occupy a position relative to the urethral orifice corresponding to Bartholin's glands in their relation to the vaginal orifice. Their affections are catarrhal or gonorrheal. They may be treated by injection, incision, or excision. In order to inject them, Kelly showed a little syringe, which fully meets all the requirements, consisting of a delicate, blunt-pointed cannula about 5 cm. long and 1 mm. in diameter; a piece of simple rubber tubing drawn over the end of the larger cannula after closing the open end then made an excellent syringe, serving by the elasticity of the walls of the tubing to draw a few drops of fluid up the cannula. With a simple syringe of this sort the amount of fluid injected was fully under control. After citing a number of cases treated by injection and by excision, Kelly referred to an interesting case in the hands of Hunner, his associate, in which smegma bacilli were found in the abundant secretion from one of these glands, showing how readily a tuberculosis of the urinary tract might have been inferred even though the vulva had been cleansed before the patient passed her water. If more careful attention was paid to these tiny structures, many cases of persistent urethritis or dysuria which have resisted treatment could be relieved.

Plastic Surgery of the Female Urethra.—[Many methods of constructing this membranous canal have been tried, some of them with marked success; but the literature shows that the same method can rarely be applied twice, since each of the accidents happens in its own way, and calls for a new and specially devised operation.] H. P. Newman² gives the details of a case, the patient being now under treatment at the Marion Sims Hospital, the progress of which, though satisfactory, has been tedious, and the patient has not entirely recovered. *Case:* Mrs. S. W., aged 39 years, has been married 3 years. There is a generally

¹ Amer. Med., Sept. 12 and 19, 1903.

² Am. Jour. Obstet., Oct., 1902.

PLATE 5.



Primary carcinoma of the female urethra (Vineberg, in Am. Jour. Med. Sci., July, 1902).

contracted pelvis with an ankylosed hip, resulting from a severe attack of Pott's disease in early childhood. She has had one full-term child which was extracted forcibly through the narrow pelvis while the bladder was distended with urine. The floor of the bladder was torn and the urethra was laid open along its entire length. Six weeks later, the patient still being in bed, an attempt was made to repair the tear. This was repeated twice in the following year. Three months later the patient came to Newman with a complete exstrophy of the bladder. The following operation was performed: flaps were taken from the vulva on either side, and after splitting the bladder and the vaginal wall, a considerable closure was accomplished by means of silver wire sutures, a drain or retention-catheter being inserted in an opening behind the line of sutures and the patient being kept in an exaggerated dorsal position until the wound healed. One month later a second operation was done, still more of the bladder being closed. This operation permits the patient to retain her urine for a couple of hours. Unfortunately she left the hospital while Newman was away from the city, and so the operation has never been finished. Newman advises that the uterine appendages be removed from the uterus, and the uterus turned on itself and then the torn bladder be so sewn about it that the uterus with its canal serve as a new urethra. He has not tried this procedure, but believes that it would be most successful and efficacious.

Primary Cancer of the Female Urethra.—Vineberg¹ operated for this disease on a woman of 36. Her youngest child was 9 years old. She had been subject to frequent micturition for many years. For the last 6 months she felt a burning sensation in the urethra. There was smarting when passing urine, but no discharge or bleeding. The meatus and adjacent part of the vulva were free from disease. This is rare, and was noted in only 7 out of 27 cases of primary cancer of the female urethra collected by Ehrendorfer. A firm growth could be seen just within the urethral orifice. It completely surrounded the lower two-thirds of the urethral canal, and the morbid deposit was thickest posteriorly; altogether the mass was as big as a small thumb. The cystoscope showed that the bladder and its sphincter were healthy; the adjacent vaginal mucous membrane was free. The whole urethra was excised, the sphincter of the bladder was damaged during the operation and repaired, but permanent incontinence of urine ensued and a plastic operation proved unsuccessful. Five months after the removal of the urethra the patient was in good health and free from any sign of recurrence. The microscopic appearance of the growth is shown in the accompanying illustrations (Plate 5). Vineberg adds 7 to Ehrendorfer's 27 cases of cancer of the urethra; among the 7 are Campbell Kynoch's² and 5 others, all published since January, 1900, the sixth being McGill's.³

Direct Examination of the Female Bladder.—[Cystoscopy, as originally practised, is not free from many inconveniences. It necessitates, in brief, a preliminary injection into the bladder of a set quantity of

¹ Am. Jour. Med. Sci., July, 1902.

² Brit. Med. Jour., vol. i, 1901, p. 1208.

³ Lancet, vol. ii, 1890, p. 966.

fluid; but this fluid may in part escape, while that which remains behind perhaps becomes stained with blood. The renewal of this fluid from time to time is also necessary, interrupting exploration. Moreover, the cystoscope itself does not furnish a direct image of the surface of the bladder.] On account of these obstacles and others which are well known, T. De-Hott¹ had advised the following means for inspecting the bladder directly. The patient lies upon an inclined plane, at 45°, and the surgeon introduces into the bladder two curved retractors, about 6 cm. long and 1 cm. wide, which results in the entrance of a certain amount of air into the bladder, with a consequent dilation. In the concavity of one of these retractors or valves a small incandescent electric lamp is fixed in such a manner as to permit the interior of the bladder to be well seen, and also, if necessary, catheterization of the ureters to be carried out. General anesthesia, without being necessary, is useful for rendering this examination easy and complete. This method of inspecting the bladder must necessarily be carried out with careful antiseptic precautions. He claims that this procedure has the advantage of being very useful and convenient. The amount of dilation of the urethra is not enough to cause incontinence of urine. J. C. Webster² states that in Kelly's method of examining the bladder the genupectoral position is assumed, or pillows are placed under the hips of the patient while she is upon her back. Both of these methods have certain disadvantages. The elevation of the hips by pads frequently flexes the abdomen on itself, so that the ascent of the intestines toward the diaphragm is prevented and the ballooning of the bladder does not take place. The genupectoral position is favorable to the bladder-distention, but is unpleasant to the patient unless an anesthetic is used. While the patient is unconscious the procedure is awkwardly carried out. During the past 3 years Webster has employed a method which is free from these objections. The patient is placed on a Boldt operating-table in the lithotomy position, the ankles being fastened to upright rods, the buttocks projecting slightly over the end of the table and resting on a rubber pad; there is a steel bar with two padded supports for the shoulders. After the patient is prepared the urethra is dilated and a speculum with an obturator is introduced into the urethra; the top of the table is turned on its transverse axis, elevating the lower end. The patient then rests on an inclined plane, being held by the shoulder supports, the trunk being flat upon the table. An elevation of about 23 inches will fully distend the bladder when the obturator is removed from the speculum. The posture has all the advantages of the genupectoral position and none of its disadvantages. In the examination of the rectum the position is highly satisfactory, air-distention being obtained in the majority of cases. T. S. Cullen³ has devised a new cystoscope (Fig. 76). In shape it resembles a short male cystoscope. Its connections are all covered, at no point being exposed. The electric lamp is relatively large in size, thus giving good illumination and diminishing the possibility of burning out. The instrument is readily controlled with a long handle. The

¹ Sem. m'éd., Sept. 24, 1902.

² Jour. Am. Med. Assoc., No. 20, May 17, 1902.

³ Johns Hopkins Hosp. Bull., June, 1903.

lumen of the tube is perfectly straight. The controller represented in Fig. 77 has recently been made and is an admirable addition to our cystoscopic armamentarium. It does away entirely with the necessity of the battery and can be used wherever the electric current has been installed. The instrument is so small that it can be readily carried in one's pocket.

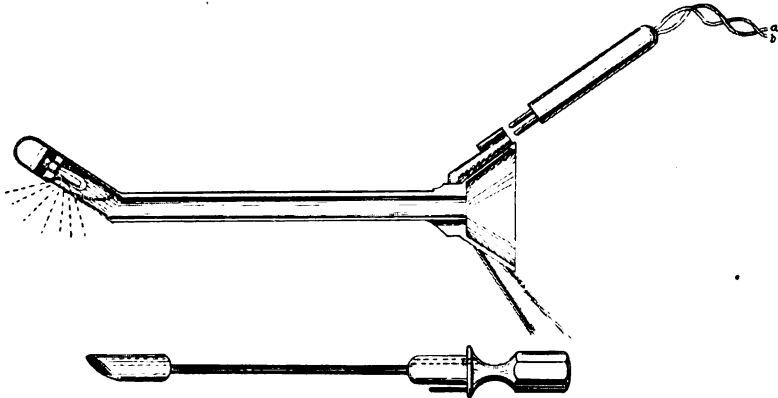


Fig. 76.—Longitudinal section of the Cullen simple electric female cystoscope. With the obturator in place the sharp angle near the tip of the instrument is completely removed. The lamp is large and is easily withdrawn from the tip of the instrument. There are no wires to get out of order. The electric attachment is indicated and may be made by an interlocking device if so desired. The wires *a* and *b*, if so desired, can be covered by rubber tubing, allowing of their sterilization. At Fig. 77 in *a* and *b* the other ends of the electric wires which are usually 6 to 8 feet long are shown (Cullen, in Johns Hopkins Hosp. Bull., June, 1903).

It is to be inserted between the socket and the globe of any electric fixture. To it the cystoscopic wires are then attached, and we can by the small wheel regulate absolutely the amount of current desired. He has been using the same cystoscopic lamps for several months without the slightest difficulty. If by any chance the lamp should give out, the cysto-

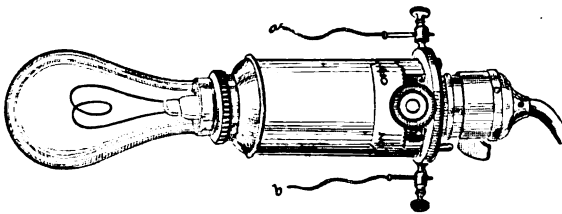


Fig. 77.—The new transformer in position. It is inserted between the plug and the ordinary electric bulb. The current is turned on as usual. With the small wheel at "off" the cystoscope receives no light. When at "on" there is abundant light for the strongest cystoscope. With the wheel in its present position there is sufficient light for the cystoscope (Cullen, in Johns Hopkins Hosp. Bull., June, 1903).

scope need not be withdrawn, but can be utilized as a Kelly cystoscope, the head-mirror and reflected light being used. The instrument is handled as follows: Both obturator and cystoscope are placed in pure carbolic acid for 10 minutes, then rinsed in alcohol, then in sterile water. A small transformer is now inserted between the ordinary electric globe

and its socket. The cystoscopic wires are attached to the transformer, care being taken to note that the small wheel indicates the current "off." The cystoscope is now connected and the wheel gradually turned until the necessary light is obtained. It is unnecessary to darken the room. After cleansing the urethral area with mercuric chlorid solution the ureter and bladder are rendered insensitive by weak solutions of cocain.

The Bladder after Hysterectomy.—The intimate connection between the bladder and the uterus makes it easily understood that the bladder is greatly influenced in its circulation and function by all operations which serve to modify the topography of both of these organs. To begin with the simplest operation, the Alexander, says G. Kolisher,¹ neither bimanual examination nor cystoscopic examination, performed in different stages of dilation of the bladder, reveals abnormal conditions. Abdominal hysteropexy, ventrosuspension, and ventrofixation in some cases, seem to have a decided influence on the circulation and function of the bladder. The cystoscopic examination in such cases reveals an extreme paleness of the mucosa; in some instances examined the epithelium seemed to be swollen and soaked. If we accept the theory that the desire for urinating is brought on by the stretching of the muscular coat of the bladder, it is easy to understand that the hanging of the uterus high up will lead to more frequent calls to urinate. In the case of a virgin operated upon by hysteropexy, in which the uterus was hung rather high, a few days following the operation the urine became cloudy and micturition so frequent that the night's rest was disturbed. This condition has continued with some diminution for 2 years. Two cases of gonococcic infection of the bladder were much worse following the same operation, and have resisted all therapeutic efforts to stop the trouble. If the bladder be properly stripped from the uterus, the bladder will remain intact. The dislocation of the bladder itself does not interfere with its function, if no special complications arise. Quite interesting and peculiar conditions arise if vaginal fixation is performed on account of prolapse and cystocele. In Kolisher's 3 patients, all of whom had had chronic retention within the cystocele, the bladder is spontaneously and completely emptied at each micturition since the operation. If the uterus is stitched too low down to the vagina, it pulls the vaginal wall and consequently the posterior wall of the urethra in such a direction as to dis-tend the urethra posteriorly. This portion of the urethra is now the mainstay of the continence, and, if weakened, the continence will be impaired. Prompt and definite relief was furnished by the introduction of a pessary.

Suprapubic Cystopexy.—H. A. Slocum² has devised an excellent operation for the relief of cystocele and vesical prolapse (see Figs. 78, 79). The technic is as follows: The intestines and omentum were walled off with a gauze pad and the pelvis inspected. The uterus lay retroverted upon the pelvic floor, the fundus being of normal size. The broad ligaments and oviducts were unusually long. The bladder was far below its usual position, the whole organ being apparently below the level of the urethra. The bladder symptoms had been severe and it was necessary

¹ Am. Jour. Obstet., Dec., 1902.

² Am. Jour. of Surg. and Gyn., Aug., 1903.

to do what could be done to relieve the condition. Holding the fundus with two fingers and thumb, it was lifted to the position it would occupy when the fundal sutures were tied, and the parts inspected. Owing to the stretching the tissues had undergone, this maneuver had no effect upon the bladder, which still lay deeply in the pelvis. Traction was then made upon

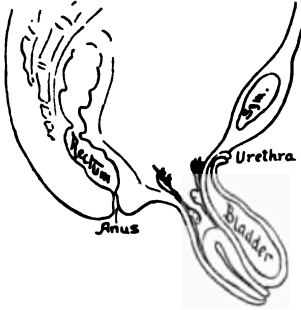


Fig. 78.—Slocum's case. Condition on admission (Am. Jour. of Surg. and Gyn., Aug., 1903).

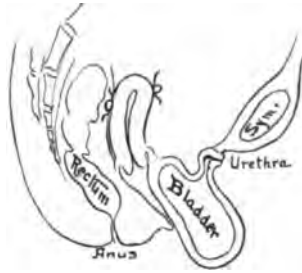


Fig. 79.—Slocum's case. Condition after tubes and ovaries were removed (Am. Jour. of Surg. and Gyn., Aug., 1903).

the peritoneal lining of the anterior abdominal wall. This was successful, and brought the bladder up to its normal position behind the symphysis, where it was kept in place by a running catgut ligature for 2 inches, 1 inch on either side of the median line, thereby counteracting the effect of the insufficient connective-tissue fibers. In the course of this operation both tubes and ovaries were removed, the broad ligaments shortened, and two silk sutures secured the fundus to the abdominal wall. For several days after the operation there was some discomfort upon voiding the urine, referred to the postpubic region; after that the urine was voided without discomfort of any kind, and the patient has gone on to thorough recovery. ;

Ureteritis in the Female.—

Garceau¹ points out that in its acute form simple ureteritis especially affects primiparas. Commencing with rigors, there is pelvic pain and vesical irritation, the affected ureter being sensitive to pressure through the vagina, considerable quantities of pus appearing in the urine in a few days. Usually part of a pyelitis or cystitis, the symptoms of ureteritis are often overshadowed by these accompanying affections. In its chronic form simple ureteritis is generally associated with chronic cystitis, though it may follow either a vesical or renal inflammation, and it most probably arises from direct extension

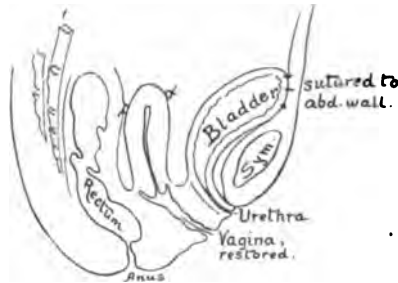


Fig. 80.—Slocum's case. Condition after cystopexy (Am. Jour. of Surg. and Gyn., Aug., 1903).

¹ Am. Jour. Med. Sci., Feb., 1903.

along the mucous membrane. Gonorrhea, calculous pyelitis, pelvic cellulitis, and inflamed lymph-glands are among other causes of the condition. Frequency of micturition is the chief and most troublesome symptom, which, though usually painless, is so constantly present as to cause considerable neurasthenia from loss of sleep, etc. Increased tenderness, and possibly some enlargement of the affected ureter, pressure upon which vaginally causes an almost uncontrollable desire to micturate, is the most important physical sign. Cystoscopically the trigone and vesical neck may be congested, with swelling of the ureteral eminence on the affected side, and there is an excess of desquamated epithelium in the urine with diminution of urea in that collected from the affected ureter. Preliminary to treatment any concurrent pelvic disease should be rectified and a simple farinaceous diet ordered, with regulated daily exercise alternating with rest. Among drugs potassium acetate, sandalwood oil, urotropin, and sodium bicarbonate are often of value, and trional should be given for sleeplessness in preference to morphin. Applications of silver nitrate solution to the trigone and ureteral eminence, or vesical injections of protargol or ichthyol, may do good, but Garceau has found that direct applications of boracic acid or silver nitrate solutions to the ureteral canal, by means of a special injector he has devised, have given great relief. Failing everything else a vesicovaginal fistula is the only remedy left. Gonorrheal stricture and calculus are the principal causes of ureteritis with obstruction, which may be partial or complete. The symptoms are those of simple ureteritis, and, should gradual dilation fail, cutting the stricture or transplantation of the ureter, and, if high up, nephrectomy or the establishment of a low fistula may be necessary. In one case of calculous obstruction small punctate ulcers were seen around the ureteral orifice, and there was marked bladder-inflammation, although the pelvis of the kidney containing the calculi was normal in appearance. In complete obstruction due to fibrous stricture the symptoms may be obscure, the kidneys becoming completely disorganized without any pronounced signs. Above the stricture dilation with considerable fibrous thickening of the ureter are secondary changes, while below an inflammatory condition exists extending into the bladder. The symptoms are usually referable to a cystitis with occasional acute attacks of kidney-pain and the malaise generally accompanying renal affections. Cystoscopically ulceration of the ureteral orifice is found, and the urine collected separately from the ureters gives an excessive deposit of pus on the affected side diagnostic of pyelitic affections. Nephrectomy, gradual dilation, cystotomy, or the establishment of an artificial fistula are the courses open according to circumstances, and the method of dilating and catheterizing the ureter and washing out the renal pelvis with antiseptic solutions has afforded relief in some instances. The symptoms of complete obstruction due to an impacted stone are frequently obscure, surgical treatment depending upon the position. In tuberculous ureteritis the symptoms are overshadowed by the renal and vesical accompaniments, but colic due to the passage of a shred of tissue may point to involvement of the ureter. On vaginal examination

thickening of the ureter, which is felt as a solid tender cord, is characteristic in cases of any duration, and pressure causes an urgent desire to micturate. The history, cystoscopic examination, and focal kidney-symptoms with the finding of the bacilli confirm the diagnosis. Total nephroureterectomy appears to afford the best permanent results, as partial resections may allow the remnant to act as an infecting center.

Ureteroureteral Anastomosis.—The unintentional division of the ureter in operations in the abdominal and pelvic cavities is not of frequent occurrence. Nevertheless, remarks George Ben Johnson,¹ this accident is apt to occur in cases in which numerous adhesions exist, and the anatomic relations are much disturbed. The ureter may be so displaced from its normal position, and be so completely embedded in a mass of adhesions, as to make its identification practically an impossibility. In the event of such an accident a decision as to the best procedure to follow is of paramount importance. Several methods of dealing with the condition are at hand: (1) The kidney on the injured side may be removed; (2) the ureter may be passed into the intestine, colon, or rectum, into the vagina, or through the abdominal wall; (3) the kidney may be brought down, and the extremity of the ureter sutured into the wall of the bladder; (4) an anastomosis may be made between the extremities of the divided ureter. This classification, while not exhaustive, covers the most important procedures so far devised. Of these methods, the last two are the most worthy of consideration. Ureteroureteral anastomosis would seem to be the operation of choice. Ureteroureteral anastomosis, or ureteroureterostomy, as the operation is designated by Kelly, may be performed in various ways. Henry Morris gives the following classifications: (a) End-to-end anastomosis by suturing the ends together in a transverse line; (b) end-to-end anastomosis; (c) lateral implantation; (d) end-to-end anastomosis by suturing the ends together in an oblique line. The transverse end-to-end method was used by Schopf (1886) in the first recorded cases of ureteroureteral anastomosis. The objections to the operation were so serious that the operation has been almost discarded to-day. Poggi originated the end-to-end anastomosis. Lateral implantation was devised and described by Van Hook in 1893. Kelly was the first to apply this method to the human subject. The oblique end-to-end anastomosis was first used by Bovée. Johnson reports two successful cases in which the Van Hook method was employed.

Complete Nephroureterectomy.—J. Wesley Bovée² defines this term as the complete removal of the kidney and the ureter at one attempt. It may be called an American operation, since the first four were performed by American surgeons, Kelly probably doing the first in December, 1895. Of the 17 cases on record, only 2 were done outside the United States. But 4 of these were males, and only 2 ended fatally. Tuberculosis of the kidney and ureter was the indication in 14 of these cases. Complete nephroureterectomy may be done by the extraperitoneal and the transperitoneal routes. Bovée seems to prefer the loin extraperitoneal with

¹ Am. Gyn., Jan. 19, 1903.

² Amer. Med., June 6, 1903.

a vaginal incision to remove the lower part of the ureter, and thinks it best to begin with the vaginal incision. He gives a full history of his second case, with the technic of the operation and its results. In tuberculosis of the kidney and ureter the strictest care to prevent contamination of normal structures is necessary. That virulent organisms other than the bacillus of tuberculosis may be in the pus should be remembered. It is well to remove the kidney and ureter *en masse* when possible, liberating the kidney first, care being taken that leakage from the cut end of the ureter does not occur. In favorable cases, if thought advisable, the ureter may be divided between clamps at any point where the distention is not marked. Whether pus be present or not, drainage should be employed, as not to do so is to invite at least the accumulation of a large amount of serum in the extraperitoneal space made in the operation.

Renal Tumors.—C. P. Noble¹ reports 2 rare and interesting cases of renal tumors (see Plates 6, 7). One was a hypernephroma (Plate 6) which, until recent years, was imperfectly understood and variously described as adenoma, lipoma, angioma, carcinoma, and endothelioma of the kidney. In 1883 Grawitz asserted that these growths originated from misplaced portions of adrenal tissue included in the kidney-substance during the developmental process. This view has been widely accepted, and only a few observers remain who consider them as originating from the uriniferous tubules or from the proliferation of the endothelium of the bloodvessels and lymph-spaces. Therefore, for the most part these growths are now called *struma lipomatodes aberrati renis*, *struma suprarenalis* or *hypernephromas*. For the different views concerning the origin of the growths one is referred to the critical review by A. O. J. Kelly.² Clinically the growths are soft and "marrow"-like, are well capsulated and rarely invade the pelvis of the kidney and, therefore, rarely produce hematuria. They are very vascular and there is a pronounced tendency to marked interstitial hemorrhages leading to cyst-formation. They may attain a large size and at times show malignant properties by giving rise to metastasis through the bloodvessels, especially to the lungs, liver, and bones. Most of the reported cases have occurred in men and women between 40 and 50 years of age. In general they distinctly resemble adrenal tissue. The second tumor was a very rare papillary carcinoma springing from the pelvis of the kidney and invading the renal substance (Plate 7).

MENSTRUATION AND ITS DISORDERS.

Precocious Sexual Development.—Roger Williams³ reports over 100 authentic cases of precocious sexual development collected from the literature of the nineteenth century, the large majority of which belong to the earlier part of the century. This anomaly is of much commoner occurrence in females than in males, the proportion in this series being 80 females to 20 males. All nationalities in civilized communities are

¹ Am. Gynec., July, 1902.

² Phila. Med. Jour., July 30 and Aug. 6, 1898.

³ Brit. Gyn. Jour., May, 1902.

PLATE 6.



Noble's case of hypernephroma of the kidney (*Am. Gynec.*, July, 1902).

PLATE 7.



Noble's case of papillary carcinoma of the kidney (Am. Gynec., July, 1902).

prone to this anomaly, but there is no evidence of its occurrence among savages. The different types of sexual precocity in females are classified as follows: Menstruation appearing prior to other signs of sexual evolution; precocious menstruation with the early appearance of other signs of puberty; precocious sex-manifestations without menstruation; early conception and pregnancy; sexual precocity with intraabdominal tumor. Transitory vaginal hemorrhages in newly born children, lasting for a few hours or for several days, are of such frequent occurrence that they may be regarded as physiologic and as the prototype of the menstrual flux. In the cases reported the time of menstruation varied from birth to 6 years. At later periods so many examples are mentioned that it is unnecessary to cite individual cases. There were 13 cases of precocious sexual development associated with intraabdominal tumors, and 15 instances of precocious pregnancy, the age varying from 8 to 12 years. Sexual precocity is not incompatible with healthiness, yet most of those afflicted have poor health and are generally short-lived. A large proportion are rachitic, especially the females, and their dentition and skeletal development are generally backward. The mental qualities of these anomalous children never corresponds to their sexual development; either they are psychically childlike or they are unusually dull, mentally defective, or even idiotic, and seldom manifest any passion for the opposite sex. They generally come of large families, but rarely more than one in the family is affected. Female precocity of the less extreme kind, as menstruation between the normal period and the tenth year, is generally indicative of vigor and vitality above the ordinary. Such females generally marry early and have more children than the average. Among the different races of mankind the lower ones are more precocious than the higher; with the advance of civilization, precociousness tends to become less and less, and there can be no doubt as to the correctness of Delaunay's dictum, that "precocity is a sign of biologic inferiority." The higher tissues and organs also are much more slowly evolved, and much less prone to precocity, than the lower ones. This is especially true of the human brain, which appears not to attain its developmental maximum until very late in life—even up to the fiftieth year; and it is noteworthy that this organ is hardly ever affected in cases of precocity.

The Weight-wave of Menstruation.—W. T. Belfield¹ offers the following conclusions: (1) During several days preceding the menstrual flow there occurs a progressive increase in the weight of a healthy young woman, often comprising from 2½ to 5 pounds, which may be from 1.5 % to 5 % of her usual weight. The climax of this gain is immediately followed by a rapid loss of a large part (perhaps half) of this increase, and then a more gradual loss, extending over several days, of the remainder. (2) The menstrual flow begins during the rapid loss of weight mentioned, its appearance often, though not always, coinciding with the beginning of the loss in weight. The flow continues with the less rapid loss which follows during the next few days, terminating about when the woman's weight regains its premenstrual level. (3) The premenstrual gain in

¹ Jour. Am. Med. Assoc., June 13, 1903.

weight is due to diminished excretion, especially of water. The rapid loss of weight which accompanies the flow is due to rapid excretion, notably of water. (4) This menstrual weight-wave was absent in a woman 59 years old, who had not menstruated for 12 years. (5) The menstrual weight-wave was observed in two subjects of irregular menstruation, at periods when the flow was scanty or absent. (See Fig. 81.)

The Influence of Menstruation on Gastric Activity.—[Both gynecologists and therapists (Müller, Eisenhardt, Freund, Jaworski and others) have long made the subject of their studies the influence of diseases of the sexual organs of the woman on disturbances of the gastro-

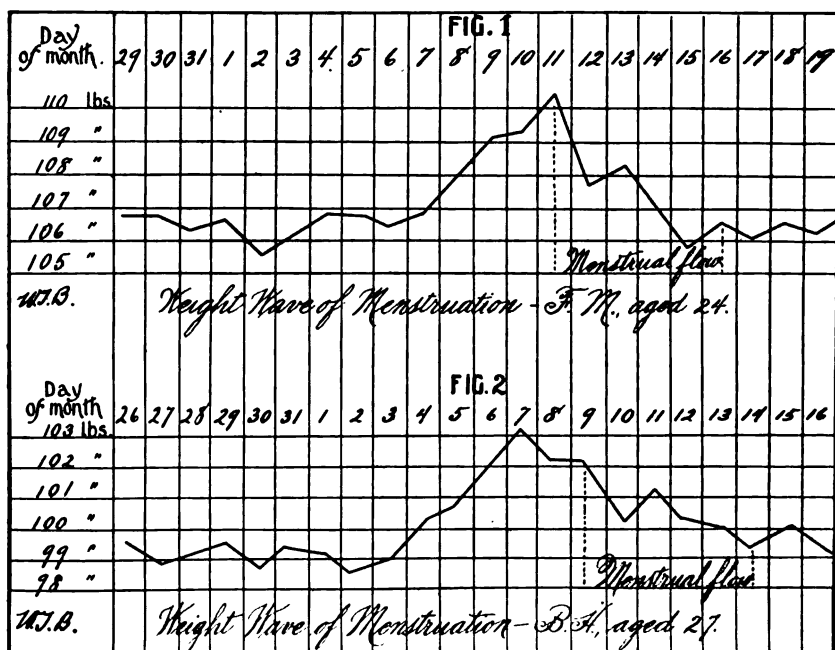


Fig. 81.—Chart showing weight-wave of menstruation (Belfield, in Jour. Am. Med. Assoc., June 13, 1908).

intestinal system.] Liembick,¹ after a series of experiments on the connection between menstruation and gastric activity in the healthy woman, reaches the following conclusions: (1) There is an undoubted connection between the two; (2) during the menstrual period there occurs an increase in the acidity of the gastric secretions—the so-called *hyperaciditas menstrualis*; (3) there is at the same time a hypersecretion of the gastric juice; (4) the motor activity of the stomach is considerably lowered during menstruation; (5) all these phenomena are of reflex origin. The practical value of these phenomena, even though not so great, is nevertheless important enough to attract our attention; (a) the stomach-

¹ Pezeglad lekarski, No. 43, 1902.

contents should not be examined during menstruation, as the results obtained are not to be relied upon as a true indication of the individual's gastric activity; (b) in case there appear any gastric disturbances in a menstruating woman, we should rather resort to alkalis than acids; (c) women who suffer from ulcers of the stomach should observe an especially strict diet and rest during their menstrual periods, for it is at this time that the morbid process is liable to become worse, and even hemorrhage may appear. In some cases the author observed increase of the acidity and hypersecretion of the gastric contents during the interval between two menstrual periods, a condition analogous to what the Germans call *Mittelschmerz*. Under this term we are to understand the appearance in the interval between two menstrual periods of various painful sensations, such as gastric, abdominal, and lumbar pains, a sensation of weight in the pelvis, sometimes an increase in the vaginal secretions, etc., announcing the approach of the menstruation. Fliess asserts that the majority of women know of these "intermenstruating" symptoms. It seems that the heightened irritability of the nervous system in the woman at this period is reflected not only on the whole system, but also locally on the activity of the stomach.

The Tube and Uterus in Menstruation.—Moltzer¹ in an inaugural thesis (Utrecht, 1902) examined healthy tubes removed from 2 patients during the menstrual period. In one case there was an ovarian cyst. Before the parts were disturbed a drop of blood was seen issuing from each ostium, and the tubes were markedly hyperemic. The vessels were found on microscopic examination to be dilated, the lymphatics contained many multinuclear leukocytes, which also lay in quantities under the epithelium. The epithelial cells showed vacuolation. In no part of the tube were they seen to be broken down or deficient. Toward the ostium hemorrhagic infarcts and hyperemia were more marked than the proliferation of leukocytes. There was no true submucous hematoma. As the inner half of the tubal canal was quite free from blood, the hemorrhage could not have originated from the uterus. There was no evidence of catarrh or other inflammatory changes, and as the veins in the tube were not more engorged than the arteries, the appearance actually detected could hardly be due to venous stasis caused by the ovarian tumor. In the second case the fimbriæ were stained by free blood, and the microscopic appearances of the tube were substantially the same as in the first. Moltzer concludes that the tube naturally has a share in menstruation. Blood manages to escape into the lumen without breaking down the epithelium, which is just what De Sinety observed in the menstruating uterus. [Most recent researches into the histology of menstruation have been made under favorable circumstances, as in winter when decomposition is least likely to set up misleading changes; it at least seems certain that the epithelium does not break down. The hematomas and defects in the epithelium of a large area of endometrium are always of doubtful import, and most probably signify not menstrual changes, but damage during operation, clumsy section-cutting, or portmortem changes.]

¹ *Monats. f. Geb. u. Gyn.*, Jan., 1903.

Adrenalin in Metrorrhagia.—Debrand¹ reports 2 cases of metrorrhagia of the menopause, in the treatment of which condition he gave adrenalin internally with great success, stopping the hemorrhages immediately and permanently. He believes it to be an excellent hemostatic, but still advises the ordinary hemostatics besides. Very small doses should be given at first, since it may cause injurious results. Iron should not be administered in this condition, but a change of air and bathing are of service. Campbell² (Philadelphia) reports 3 cases of uterine hemorrhage from polyps or fibroids which were promptly relieved, after other remedies failed, by the administration of 15 drops, internally, 3 times a day of a 1 : 1000 solution of adrenalin chlorid.

Some time ago Lafond-Grellety obtained excellent results in bleeding from the uterus by the internal use of calcium chlorid. G. Gross,³ acting on this suggestion, has also obtained a very satisfactory outcome in 4 women who were suffering from bleeding from the uterus. The degree of cure was such that the women, who were very anemic and emaciated, gained flesh and strength and soon resumed their ordinary occupations. His method is, briefly, that the patient shall take daily a douche containing 10 parts of calcium chlorid and 200 parts of distilled water, preceded always by a cleansing douche. He at the same time considers it advisable to administer by mouth the following prescription: Calcium chlorid, 4 parts; peppermint-water, 30 parts; distilled water, 90 parts; to be given in teaspoonful doses every 2 hours. He states that this combination of douche and internal medication is exceedingly satisfactory. The treatment may be maintained for a long time provided the kidneys are in good condition, as the calcium chlorid is readily eliminated.

Dysmenorrhea.—The Etiology of Dysmenorrhea.—Some cases of menstrual pain are cured by dilation of the cervix, and others are not. It is plain that the former cases have at least one feature in common. The latter may be of the most diverse kind. Although this disease is most common, say G. E. Herman and H. R. Andrews,⁴ few text-book authors consider it worth while to treat of it in their books. One theoretic statement as to the causation of dysmenorrhea, given by so many writers, is that the uterus is anteflexed. Antelexion is present in precisely the same proportion of women who menstruate without pain as in those women who have straight uteri. Sir J. Williams has reached the conclusion that the uterus is imperfectly developed, but that this does not retard the onset of menstruation. Primary dysmenorrhea, or dysmenorrhea which starts with the onset of the puberty, is more likely to be cured by dilation than that which is acquired. Especially is this true when the pain begins before the twenty-fifth year. Menstrual pain may be acquired at almost any time during the first half of menstrual life. The pain of menstruation may be of two kinds—general aching due to congestion of the pelvic organs which precedes menstruation, which is relieved by bleeding from the uterus, and the sharp uterine colic. The former is not relieved by dilation, the latter is often cured by it.

¹ La Tribune Méd., July 23, 1902.

² La Sem. Méd., 1902, No. 22.

³ Clin. Rev., Jan., 1903.

⁴ Brit. Jour. Obstet., Jan., 1903.

The pain of pelvic congestion not only begins earlier, but lasts longer than that of uterine spasm. Spasmodic pain does not permit the patient to lie down; pelvic congestion is relieved by quiet recumbrance. Spasmodic pain is severe and is usually accompanied by nausea and vomiting. In most cases of dysmenorrhea there is no sign of organic disease of the uterus. The most obvious explanation of the cure of the menstrual pain by dilation of the cervical canal is that the pain is caused by the narrowness of the canal. The cervical canal of a young multipara has never been seen so narrow as to prevent the flow of the menstrual blood. Such stenosis only exists in diagrams. The writers have come to the conclusion that the narrowness of the cervical canal is most often sufficient to account for a condition underlying, and perhaps causing, the spasmodic dysmenorrhea, acting not by causing mechanical obstruction, but by preventing physiologic dilation. The treatment of these patients consists in the dilation of the cervical canal by bougies.

The Treatment of Dysmenorrhea.—[The inefficacy of the treatment of dysmenorrhea is shown by the multiplicity of remedies recommended. The statement is made, however, that beneficial results have been obtained from the administration of thyroid extract in dysmenorrhea owing to the intimate relationship which exists between the utero-ovarian zone and the thyroid gland. It is stated that Stimson, of San Francisco, has been successful in 80 % of his cases. He administers a grain of the dried extract 3 times a day for one or two days preceding the menstruation and doubles the dose during the period.] Fisher¹ calls attention to the intimate association between the genital apparatus and the thyroid gland. He states that occurrences which influence the genital tract, such as puberty, pregnancy, and uterine fibroids, very frequently cause enlargement of the thyroid gland. He also notes that deficiency of the normal thyroid secretion is often accompanied by atrophic changes in the genital apparatus. Consequently, it seems from the foregoing statements that thyroid extract is deserving of a place in the treatment of dysmenorrhea.

An editorial in "American Medicine"² says that the presence of **painful menstruation** indicates the necessity for careful physical examination to ascertain its cause. These causes are varied. Any malposition of the uterus or its appendages, a stenosis of its canal, or any inflammatory condition along the genital tract, may be the causative factor of dysmenorrhea. The position of the pain and its relation to the flow of blood afford material aid in diagnosis; but very frequently the gynecologist finds that severe dysmenorrhea occurs without any demonstrable pathologic lesion in any part of the genital apparatus, and often this so-called neuralgia or **spasmodic dysmenorrhea** is most difficult to treat. As a rule, it is unwise and irrational to mask the symptoms by giving opiates, although it may be necessary during a severe paroxysm; but the satisfactory results which have been obtained by the use of nitroglycerin lead us to emphasize its value for the relief of this condition. By detailing a typical case its range of usefulness may be indicated. The

¹ Jour. Am. Med. Assoc., Dec. 6, 1902.

² June 6, 1903.

patient is usually a nulliparous woman of sedentary occupation, often anemic, who just a few hours prior to the establishment of the flow has marked vasomotor constriction, as shown by facial pallor, blueness of the lips, coldness of the extremities, and a sense of pelvic engorgement. By the administration of $\frac{1}{100}$ grain of nitroglycerin every 3 or 4 hours until the flow is satisfactorily established, the physician may often relieve his patient in a thoroughly rational manner without resorting to opiates or other anodynes. Be it understood that it is only when clear indications exist for vasomotor dilation that this remedy will alleviate. Other cases in which cervical angulation or stenosis is present are best treated by rapid dilation under anesthesia; or if due to malposition or diseased appendages, an appropriate surgical procedure must be employed.

Nasal Therapy for Dysmenorrhea.—[Five years ago Fliess published a monograph on the connection between nasal and menstrual conditions, the main thesis being that in the nose there are two "genital spots," one the tuberculum septi and the other on the inferior turbinate, which in many women show congestion and sensitiveness during menstruation. In some cases of severe dysmenorrhea Fliess found he was able to control the pain by applications of cocain to these "spots," and more rarely he permanently cured the menstrual difficulty by cauterization of the same region. The idea of relationship between the upper respiratory tract and the genital organs in woman is much older than the contribution by Fliess. Bleeding from the nose and pharynx during menstruation has often been noted, and the same periodic phenomenon has been recorded in cases of amenorrhea caused by pregnancy, the menopause, or pathologic conditions. Since the publication by Fliess of his findings the subject has been discussed at length in some Continental medical societies, and has been reported on by a number of clinicians, all of whom seem to find a certain percentage of cases amenable to this treatment. Schiff found cocain effective in 35 out of 41 cases, and concluded that it was of service in those cases in which the pain persists after the flow is well established. Koblanck, Ruge, Knorr and Krönig have all reported series of cases favorably affected.] More lately Ephraim¹ has been successful in arresting the pain of intense dysmenorrhea in 18 out of 24 cases treated by cocain. In Amann's clinic Linder² has been studying this subject for the last two years on a series of 30 cases. The relief from pain has been so marked that some of the patients have returned to have other painful disorders treated. The influence of suggestion in rendering this treatment effective has been discussed time and again, and proves a difficult question to decide. Schiff carefully undertook to rule out this factor and found that applications of water were ineffective. Linder reports a special series of 16 cases selected with great care in order to test more exactly this nasal therapy. In 10 of these cases cocain caused cessation of pain, sometimes lasting 24 hours. When the pain returned, Linder tried a second application, this time secretly substituting plain water for the cocain solution. Two of the 10 were again favorably affected. Repetition of the cocain treatment then proved

¹ Allg. med. Cent. Ztg., March 12, 1902.

² Münch. med. Woch., June 3, 1902.

effective in all cases. Linder is forced to think that in some instances suggestion is the strongest factor in the result, although it must be remembered that even water causes a physiologic effect on the nasal mucous membrane. For him the question of a nasal dysmenorrhea remains *in suspensio*, but the striking number of cases which are relieved by nasal therapy, which is harmless whether or not it involves suggestion, recommends a method which ought to be equally welcome to physician and patient for the treatment of such an obstinate disorder. The cocain is applied on a pledget of cotton through a speculum, 2 or 3 drops of a 10 % to 20 % solution, and is carefully limited to the "genital spots," so that there is no danger of intoxication. To be effective it may have to be repeated in 15 minutes. The cessation of pain, even if for only overnight, is extremely grateful to the patient. Cauterization, in the experience of several men, permanently cures far fewer cases of dysmenorrhea than cocain temporarily relieves.

Menopause.—José Zunzunezui Echevarria¹ states that **cardiac disturbances in the menopause** are of two kinds; one being of organic nature, brought on or increased by the menopause; the other, and most frequent, being a purely functional disturbance, which manifests itself in palpitation and tachycardia. The latter may be entirely reflex, and due to the influence of the menopause upon the uterus, liver, stomach, or nervous system. In other instances this symptom may be present without organic affection of any kind. In Echevarria's opinion, arterial overtension and excitation of the sympathetic nervous system enter into the pathogenesis of this last form; and he advances the theory that the arteriosclerosis, of which overtension is the first manifestation, may be induced by the disturbances brought about in the organism through the influence of the menopause. He holds, further, that tachycardia due to excitation of the great sympathetic may be produced through sanguineous plethora or ovarian insufficiency; and believes that the admission of the latter possibility may lead to the advantageous employment of opotherapy in such cases.

UTERINE INFLAMMATION.

Treatment of Endometritis.—Menge² calls attention to the superior excellence of **formalin** as an escharotic as compared with zinc chlorid. He employs both the pure drug and the 50 % solution. It is especially valuable in cases of endometritis following abortion and labor at term, a single application often being sufficient to stop hemorrhage and foul discharges. The writer is strongly opposed to intrauterine injections of caustic solutions. Kozlenko³ discusses the therapeutic applications of **thiol** in gynecologic practice. He employs this drug, either in the form of tampons saturated with a 20 % to 50 % watery or glycerin solution, introduced daily or every other day, or in the form of rectal suppositories made

¹ Revista de Especialidades Médicas, March 5, 1903.

² Zent. für Gynäk., 1902, No. 13.

³ Praktitchesky Vrach, vol. i, Nos. 45 and 46, 1902.

of powdered thiol, 0.3 gm. in each. In acute and subacute inflammations of the perimetrium he employs pure thiol, either in the form of direct application or tampons. In endometritis and endocervicitis he uses pure thiol in the form of intrauterine applications or external inunctions of the abdominal walls.

The Present Status of the Use of Steam in Surgery and Gynecology.—M. F. Kozlenko¹ reviews the different uses of steam in diseases of women and in surgery. The first application of steam was made 15 years ago, when Snegireff suggested its use in the arrest of uterine hemorrhage. Since then a number of new uses have been found for the method in question. A number of authors recommend the use of steam in cases of endometritis, and recently steam has been employed to obtain relief in cases of metrorrhagia in the climacteric, or in profuse bleeding from the uterine cavity depending upon senile catarrh. Such cases are often resistant to every form of treatment, and frequently the question of removing the uterus arises, though the patient's condition is very often excellent. In such cases steaming the interior of the uterus for the purpose of destroying the entire diseased mucous membrane has given good results, inducing ultimately an artificial climacteric. Steam has also found a number of applications in the treatment of diseases of the eye, nose, and throat, but the most interesting use of it is in resections of the liver, in which it is applied for the arrest of the bleeding. A steam saw has been devised for this purpose by Snegireff, the purpose of which is to arrest the bleeding as the liver is cut. The instrument looks like an ordinary small surgical saw, but is hollow and its hollow handle is connected with a steam apparatus. Small openings are provided on the cutting surface between the teeth of the saw through which steam passes directly into the tissues traversed by the instrument. Experiments on animals show that this saw arrests bleeding when used in resections of the liver. The steam is driven through the saw at a pressure of two atmospheres. It arrests instantly bleeding from parenchymatous surfaces, and the liver can even be kneaded with the hand after having been cut without inducing any more bleeding. The author believes that this saw offers the best method of arresting bleeding in operations upon the liver and spleen.

On Columnization of the Vagina in the Treatment of Metritis.—F. Boukowsky² recommends the use of a procedure called "columnization" in gynecologic practice. This procedure is a special form of tamponing of the vagina, which is applied in the knee-chest position. The posterior wall of the vagina is pulled back with a Sims speculum, so that the cervix and a part of the vaginal vault become easily accessible. A strip of gauze, 1 yard wide and from 1 yard to 1½ yards long, sterilized or slightly impregnated with iodoform, is moistened in glycerin and pressed out, so as to remove the excess of fluid. This piece of gauze is then introduced firmly into the vaults of the vagina by the fingers, chiefly into the posterior and lateral fornices, partly into the anterior, so that

¹ Roussky Vrach, Jan. 18, 1903.

² Jour. Akousherstva i Gienskikh Boliesney, Feb., 1902.

the cervix is evenly surrounded by a mass of gauze. The upper part of the vagina is also packed in the same manner. Instead of gauze, tampons of sterilized cotton may be used. This procedure was first employed in America by Talliafero, of Atlanta, in 1878. Coe, Tucker, Jackson, and Potter have written reports on its value. The French gynecologists were the next to take it up. The present author gives the results of 5 years' experience with this method of tamponing, which he has applied in over 1000 patients. He finds gauze to be the best material for this purpose, and that ichthyol is the best medicinal agent for impregnating the tampons. The patient is placed in the ordinary gynecologic position, her external genitals are scrubbed with soft soap and irrigated with a solution of formalin (1 : 500). A Sims speculum is introduced, drawing back the posterior vaginal wall, and the tampon applied as described above. The best results with this treatment are obtained in cases of metritis, pure or complicated with retroflexions with adhesions, in exudates in the cavity of the pelvis, and in salpingoöophorectomies which are suitable for nonoperative treatment.

UTERINE DISPLACEMENTS.

Intraabdominal Pressure.—Meyer¹ considers this expression erroneous, and affirms that there is no such thing as a constant pressure which is the same at every point in the peritoneal cavity. The comparison between the difference in pressure in the pleural cavity and in the external air and that within the peritoneum is not justified on account of the elasticity of the abdominal walls. In the normal condition the equilibrium between the abdominal cavity and its contents is maintained, and when the air is allowed to enter at the operating-table the intestines, even when not previously emptied, protrude only to a slight degree. If they have been thoroughly evacuated, it is even possible to establish a negative intraabdominal pressure artificially by drawing up the unopened peritoneum, the muscular wall being thoroughly relaxed under anesthesia. Normally it cannot exist. That the pressure is never constant at all points is evident when one considers the variable conditions present in the intestines and bladder, the peristaltic movements and those of the diaphragm, the contractions of the voluntary muscles, etc. The supposed variation in pressure due to different positions is also entirely theoretic. Kossmann² replies to Meyer's article. While agreeing with the latter in his assertion that this pressure is constantly changing and that it is never negative, he denies that it varies at every point in the cavity. The writer claims that this pressure is everywhere alike, and is only unequal when gas or fluid is abnormally present in the free cavity. Intraabdominal pressure becomes a disturbing factor, he believes, when it is sufficient to overcome the normal power of resistance of the muscular wall.

Treatment of Congenital Antelexion.—Alexandroff³ describes the following operation for the relief of dysmenorrhea due to congenital ante-

¹ Zent. f. Gynäk., No. 22, 1902.

² Zent. f. Gynäk., 1902, No. 27.

³ Frauenarzt, Heft 193, 1902.

flexion: The os externum is drawn apart with two pairs of bullet-forceps, while an incision is carried downward along the anterior vaginal wall, beginning at the portio. The cervix is dissected off as in vaginal hysterectomy as high as the os internum, is then split, and each half is sutured to the edge of the vaginal wound on either side, in such a way that the cervical endometrium is united to the submucous muscular layer of the vagina. The flaps of mucous membrane are next allowed to slide over the sutured edges, to which they are also sewn, thus covering all raw surfaces. A strip of iodoform gauze is introduced into the canal and the vagina is tamponed. The stitches are removed on the tenth day and the patient may leave her bed 2 days later.

Operative Treatment of Prolapsus Uteri.—Berry Hart,¹ after a careful review of cases and operations, sums up as follows: Prolapsus uteri may be regarded as a hernia of a definite part of the pelvic floor. After replacement the hernia is reproduced by the patient's straining. The most useful operations are the combined cervical amputation, elytrorrhaphy and perineorrhaphy in medium cases, and ventrofixation in selected cases. In advanced cases in widows vaginal resection and hysterectomy have to be considered. Baumm² refers to the anatomic and static elements in the causation of prolapse, and discusses the relation of retroversion and flexion to uterine prolapse. He considers prolapse of the vagina alone to be very rare and slight. Küstner and others have maintained that, when the uterus is retroverted, its axis is in line with that of the vagina, instead of making a sharp angle with it; in this position abdominal pressure does not force the anterior uterine wall against the anterior vaginal wall, but carries the uterus like a plug into the vagina, folding the anterior vaginal wall on itself, and causing it to appear at the introitus vaginæ. This belief determines the action of those who consider a fastening of the uterus in a position of anteversion to be an essential part of any operation for prolapse. Some, however, consider retroversion to be secondary to the descent of the anterior vaginal wall, or hold, like Hegar, that any considerable retroflexion tends to hinder the development of prolapse. They, naturally, will not complicate their operations by any attempt to antevert the uterus. The writer holds that clinical observation cannot settle the point, which can only be determined by operative experience. He himself for some time combined vaginal fixation with anterior and posterior kolporrhaphy and reported his results in 1897. There was recurrence in 30.7 % of his operations. Whether these results were worse than those obtained by him before using vaginal fixation he has no figures to show. He has subsequently, however, operated for prolapse 95 times without any attempt to fix the uterus forward, and has followed 86 of the cases. In 8 the immediate result was not satisfactory, and recurrence of the prolapse quickly followed. Of the total, there was recurrence in 26 cases (30.2 %) and permanent good results in 60 (69.8 %). Comparing this with his previous figures, he concludes that in operation for prolapse it is a matter

¹ Brit. Med. Jour., Oct. 11, 1902.

² Jour. Obstet. and Gynec. of Brit. Emp., May, 1902.

of indifference whether the uterus be fixed forward or left in a faulty position. The results of other operators when employing vaginal fixation for relief of prolapse are reviewed. Herff claims permanent cure in 78 %; Schmidt obtained the same. Schultze operated in 10 cases, in 8 of which prolapse quickly followed. He gives a table in which are compared the results obtained by ventrofixation, the Alexander-Adams operation, fixation of the round ligaments in the vagina, and shortening by the Wertheim method. The results are variable. The Alexander-Adams operation comes out with only 33.3 % of cures. Other methods gave permanent relief in about 70 %. Another table gives the results obtained by other operators without any attempt at fixation of the uterus. In simple cases 71.1 % were cured by kolporrhaphy and kolpoperineorrhaphy. In severe cases 75 % of cures followed the same measures with the addition of amputation of the cervix. The causes of failure are next discussed. The more complete the prolapse, the more likely it is to occur. Parturition following operation is a common but by no means universal cause of recurrence. The effect of the age of the patient is a point not yet sufficiently observed.

E. Stanmore Bishop¹ claims that the true ligaments of the uterus which preserve it at its normal level and prevent prolapse are the fundopubic or round ligaments in front and the sacrouterine or retrosacral ligaments behind. Of these, the latter are by far the more important. Their relative shortness, the position of their implantation below the main bulk of the uterus, their coordinate action with the vesical attachment in front, all render them more effective in maintaining the uterus in its normal position than the comparatively longer round ligaments which act upon the fundus. To ventrofixation, which he has many times performed, Bishop sees many objections, and mentions vaginofixation only to condemn it. He states the anatomic and physiologic objections to these procedures and contends that the true remedy for any severe prolapse is the reproduction of the sacrouterine ligaments, since in those cases in which they are absolutely torn through no amount of rest will reunite them. Torn fibers retract and atrophy from disuse. In the upper extremity of the posterior fornix a sufficiently firm resistant material is available which, while firmly attached to the cervix, yet is of sufficient length between its most superior point and that blended with the latter to permit of normal freedom of movement. It is this which is utilized as the new sacrouterine ligament. Its superior surface is covered with peritoneum. If this is denuded by removal of a short, narrow strip, its connective-tissue surface is bared for attachment to the parietal peritoneum behind; the best point of attachment is between the rectum on the inner side and the ureter on the outer, its height on the sacrum varying with each case. The technic of the operation is as follows: After opening the abdomen a thread is passed through each broad ligament, inclosing tube and round ligament. These are used as tractors to draw the fundus forward. A sound in the posterior fornix renders the latter prominent. A thick thread is passed vertically through each side, avoid-

¹ Lancet, March 14, 1903.

ing the mucous lining, so that each protruding end is $\frac{1}{2}$ inch distant from the other, and the whole loop $\frac{1}{2}$ to $\frac{3}{4}$ inch from the cervix. The fornix is now applied to the sacrum, and a spot chosen directly opposite, free from vessels, nerves, and ureter, and well outside the rectum, where the needle carrying the suture is entered deeply so as to embrace the peritoneum, and brought out $\frac{1}{2}$ inch above. Before tying this suture a narrow strip of peritoneum is removed, both from the fornix and the wall opposite. The round ligaments are then shortened by Olshausen's method.

Hysterokataphraxis.—The meaning of this new word is the inclusion of any viscus, for example, the uterus, within supporting metal sutures as a medium of replacement. A. Catterino¹ (Camerino, Italy) has devised the following operation, which he denominates by this term, as a substitute for ventrosuspension or ventrofixation or as a more secure type of these operations. After the usual method of opening the abdomen, exposing and bringing the uterus into the wound, a gold or pure silver-wire suture is passed through all the layers of the abdominal wall except the skin, thence through the broad ligament close to the uterus opposite the juncture of its lowest and middle third, and from this point in reversed order through the broad ligament and parietes on the opposite side. A second suture is passed in the same manner above this, around the organ just below the insertions of the round ligaments. Either before or after the abdominal layers are apposed the wires are twisted together and then the skin is sutured. Instead of two sutures, only the upper may be used. Again, both may be passed like Halstead's intestinal mattress-suture—namely, after passing the lower suture, instead of cutting the wire, it is carried along between the aponeurosis and the skin of the side of its emergence and then entered as before on that same side at the level for the upper sling. In this manner on one side both free ends will be twisted together, while on the opposite the continuous line of wire will be seen passing from above downward. Catterino states that its results are good as a means of support, but does not discuss its attrition upon the structures concerned.

RETRODISPLACEMENT OF THE UTERUS.

The Present Status of the Pessary in the Treatment of Retro-displacement.—[Twenty-five years ago the pessary was the sole method of treating uterine displacements. This instrument has been neglected in the rapid development of surgical technic, which offers more certain relief. The pessary is now regaining its position to some extent, and the indications for its use are better understood. In uncomplicated displacements in young women who have not had treatment, operation should be advised. It is also the only method that holds out a prospect of cure in cases which are complicated by lacerations, or in which the uterus is enlarged or very much prolapsed. In the cases in which the uterus is small, and in which symptoms have been present but a short time, and especially if they are associated with neurasthenia, treatment

¹ Z'blatt f. Gynäk., 1902, No. 26.

by the pessary will often cure.] Davenport¹ gives a few general principles, which, if adhered to, will make the treatment of displacements by pessary a success in the greatest number of cases possible: (1) Study the cases. Determine the probable length of time that the displacement has lasted, its possible cause, the symptoms it has caused, their order of occurrence, and the relative importance of the general and local manifestations, and from these data form a careful opinion as to the chances of cure by one or the other method of treatment. (2) In a case of retroversion or retroflexion, always replace the uterus before adjusting the support.



Fig. 82.—Slocum's operation for retroversion of uterus: A, Line for removing oviduct; B, cuneiform piece removed from broad ligament (*Am. Gyn.*, July, 1903).

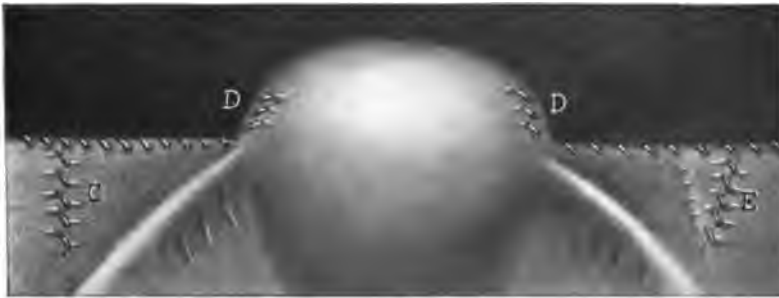


Fig. 83.—Slocum's operation for retroversion of uterus: C, Incision closed; D, sutures in cornua; E, overlapping flaps (*Am. Gyn.*, July, 1903).

The pessary should not be relied upon to do this, as only in the rarest cases will it be possible. (3) In choosing a support, choose one which fits exactly if possible; but, if not, have it rather too small than too large. (4) The ideal pessary is one which supports the uterus perfectly and without the patient being conscious of its presence. (5) The patient should be kept under observation while she is wearing the pessary and seen at regular intervals, preferably after each monthly period, for the cleansing of the support and its replacement. (6) When it is deemed

¹ *Boston M. and S. Jour.*, Aug. 7, 1902.

wise to make an attempt to go without it, it should not be removed at once, but a smaller one substituted to be worn a month, and then a still smaller one, which may then finally be removed.

The Operative Treatment of Retrodisplacements.—New methods employing the round ligaments, the uterosacral ligaments, and the broad ligaments as suspension points have been suggested during the year. Probably the most unique and suggestive operation recently devised for uterine retrodisplacement is that proposed by H. A. Slocum,¹ which he terms "**cuneiform shortening of the broad ligaments,**" and which depends entirely upon these structures to hold the uterus in place. The original technic consisted in the removal of a V-shaped portion of the broad ligament (see Figs. 82 and 83) and bringing the edges together after securing the bloodvessels. Modifications are suggested as follows: When the object is simply to correct a backward displacement after adhesions are broken up, and the fundus drawn forward by making



Fig. 84.—Slocum's operation for retroversion of uterus: F, Buttonhole through parovarium; G, buttonhole through broad ligament (Am. Gyn., July, 1903).

traction on the broad ligaments, it might suffice to shorten the latter by simply making a fold on either side, and securing it by several mattress sutures. Prolapsus could also be rectified by drawing the uterus up to the proper height and modifying the shape of the fold as well as its site. If it is simply desired to raise the fundus, a V-shaped fold should be used. If it is desirable to raise the uterus as well, an inverted Λ should be made, gathering in more at the base than at the top. If the tubes and ovaries are to be removed, Slocum suggests first tying the ovarian arteries at the pelvic wall; this would allow quicker work and less hemorrhage. Next, with scissors remove the oviduct by cutting directly beneath and parallel with it, to the uterus. With a knife two converging incisions into the cornu would separate the tube entirely, while the wedge-shaped wound in the cornu could be brought together with catgut. If the broad ligament was voluminous, a V-shaped incision could be made which would include the attachment of the ovary at its apex. Should the tissues not

¹ Am. Gyn., July, 1903.

be sufficiently abundant for this method, a simple fold would suffice, suturing it in place, or a vertical incision, making two flaps, the edges drawn past each other and sutured, either with a mattress-suture or by uniting the raw edge to the peritoneum it was lying against, or both. If the tissues are too scant to make a V of sufficient size to remove the ovary with the excised portion, two curved incisions at the base of the ovary would allow of its being dissected free and the oval wound closed



Fig. 85.—Slocum's operation for retroversion of uterus: Flaps drawn past each other and sutured, lifting that side higher (*Am. Gyn.*, July, 1903).



Fig. 86.—Slocum's operation for retroversion of uterus: Both buttonholes sutured, lifting whole uterus higher (*Am. Gyn.*, July, 1903).

with catgut. If desirable, the ovaries may be allowed to remain. Another modification is to make a buttonhole incision of varying length through one or both layers of the broad ligament, and carrying the edges of the buttonholes past each other, suture in place (Figs. 84 and 86). The direction of the buttonhole will be governed by the judgment of the operator after making traction in various directions to determine just the point where the shortening is needed. This method will be found to answer requirements when the other method is unsuitable. When it is desirable that both tube and ovary shall remain intact, the following

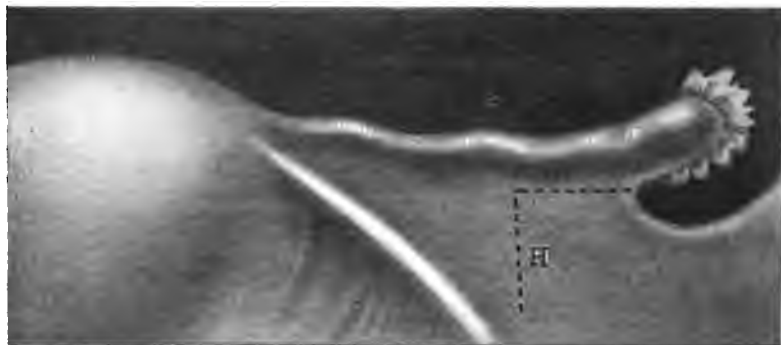


Fig. 87.—Slocum's operation for retroversion of uterus: H, Incision separating outer part of oviduct, and into broad ligament (Am. Gyn., July, 1903).



Fig. 88.—Slocum's operation for retroversion of uterus. Anterior view of left broad ligament at completion of operation: K, Anterior flap; L, outer part of oviduct refastened to top of broad ligament (Am. Gyn., July, 1903).



Fig. 89.—Slocum's operation for retroversion of uterus. Posterior view of left broad ligament, showing angle and button-hole incision (Am. Gyn., July, 1903).



Fig. 90.—Slocum's operation for retroversion of uterus. The distal flap is brought over the ovary, the latter pulled through the buttonhole, and the edges of the flap sutured, under proper tension, to hold the fundus in normal position (Am. Gyn., July, 1903).

modification will answer: Raising the fimbriated extremity, separate the oviduct from the broad ligament with scissors for the distance necessary to make the requisite flap, probably $\frac{1}{2}$ to 1 inch; then cut at right angles to this down into the broad ligament to the desired length, and carry the outer flap behind the inner one and suture (Fig. 87). In each case it is better to carry the inner or uterine flap anterior to the other, as it gives one the advantage of the thickness of the broad ligament in advancing the fundus. If the operator fears to leave the tube separated, it could be refastened to the upper edge of the broad ligament without causing constriction or distortion (Fig. 88). In any given case should the mechanical requirement call for such a line of incision, Slocum would not hesitate to cut across the round ligaments or even split them, and make their respective halves the fronts of the advancing flaps. In the method

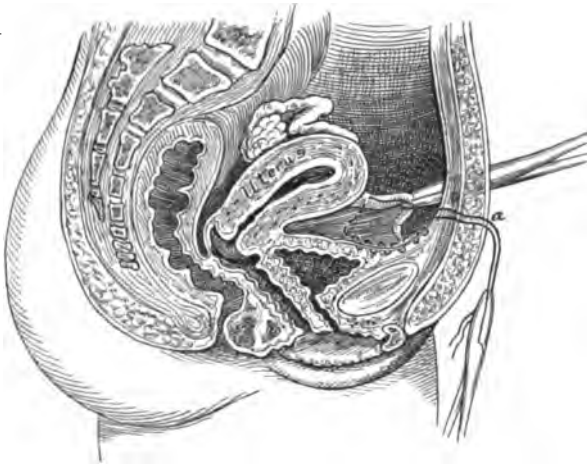


Fig. 91.—Ferguson's operation of anterior transplantation of the round ligaments for displacements of the uterus: a, Suture to prevent bowel slipping between uterus and bladder (N. Y. Med. Jour., Jan. 17, 1903).

pursued when both ovaries and tubes are to be saved, if it is found necessary to make the vertical incision close to the attachment of the ovary, the posterior flap should either be split, the upper part being attached above the ovary, and the lower part below it, or a buttonhole cut in the outer posterior flap, the ovary brought through the buttonhole, and the flap then secured at its edges, and several mattress sutures introduced over its area, if necessary (Figs. 89 and 90). If the broad ligament widens too rapidly, from above downward, it may be feasible to divide only the anterior layer with the vertical incision, and attach the inner flap to the outer one, at a site nearer the pelvic wall.

Anterior Transplantation of the Round Ligaments.—In order to leave the uterus free in the abdominal cavity with no stitches or bands attached to it an operation was devised several years ago by A. H. Ferguson¹ in which a transplantation of the round ligaments is performed

¹ N. Y. Med. Jour., Jan. 17, 1903.

for the purpose of replacing an abnormally situated uterus. Over 200

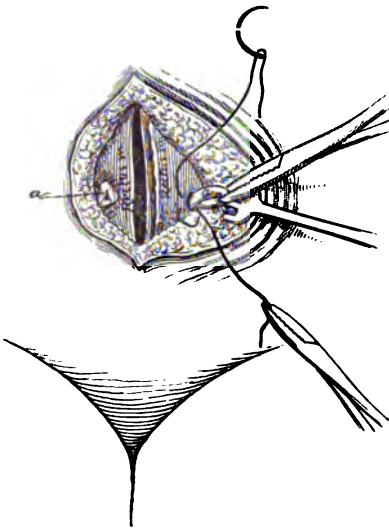


Fig. 92.—Ferguson's operation of anterior transplantation of the round ligaments for displacements of the uterus: *a*, Round ligaments coming through recti muscles (N. Y. Med. Jour., Jan. 17, 1903).

such operations have now been done by him without a death or complication except suppuration in the external wound in 3 cases. The Trendelenburg position is used and a median incision 3 inches in length is made through the abdominal wall, the lower angle reaching the suprapubic fold. The skin and fat are dissected from the anterior sheath of the rectus on either side. Two fingers are passed into the abdomen to protect the bladder and a stab-wound is made through the rectus between the two fingers, 1 inch from the median line and $1\frac{1}{2}$ inches from the pubes. Before withdrawing the knife pass a pair of forceps beside it through the wound and seize the round ligament and a portion of the broad ligament near the uterus. In order to prevent the bowel or omentum subsequently slipping between

the ligaments and bladder and causing strangulation, a suture is now in-

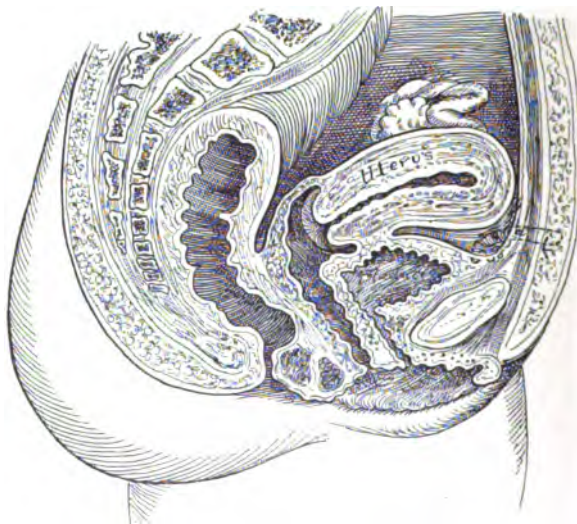


Fig. 93.—Ferguson's operation of anterior transplantation of the round ligaments for displacements of the uterus: *a*, Round ligament in its new position; *b*, suture shutting iliac and bladder regions off from each other (N. Y. Med. Jour., Jan. 17, 1903).

serted running along the parietal peritoneum from the puncture in it

downward to the bladder and backward to the round ligament near the uterus (Fig. 91). In this circular sweep the peritoneum is caught up about every third of an inch, and when the suture is tied on both sides an antero-posterior partition of folded peritoneum is thrown between the iliac and bladder regions on either side. The proximal end of the round ligament is then withdrawn through the rectus with the forceps and sewed with the subjacent broad ligament to the anterior sheath of the rectus muscle, leaving a stump about half an inch long between the uterus and the anterior abdominal wall (see Figs. 92 and 93). The other side is dealt with in the same manner. The operation is easy to perform because all the structures are seen as well as handled, there is no subsequent interference with the physiologic functions of the uterus, and the range of application is much wider than in any other similar operation.

Vaginal Shortening of the Uterosacral Ligaments.—Bovée¹ gives the following technic for shortening the uterosacral ligaments to correct retrodisplacements of the uterus: The patient is placed in the extreme lithotomy position, the perineum is well retracted, and the cervix is grasped with a volsellum forceps and drawn forward. A longitudinal incision, starting at the cervicovaginal junction, is made through the structures of the posterior vaginal fornix down to the perineum. By careful dissection the ligaments are brought into view. The amount of shortening needed is decided upon, and one of the ligaments is grasped with forceps midway between the points to be united; the traction on the cervix is lessened and the ligament brought into the vagina. A curved needle armed with kangaroo tendon is then passed through the extreme points of shortening; another is passed through the loop thus formed and through the posterior portion of the cervix below the insertion of the ligament. The opposite ligament is similarly treated. The sutures are tied after they are all in place. The vaginal wound is spread well open, and the two ends of the longitudinal incision are approximated by suture, the remainder of the wound being closed as though originally a transverse incision.

FIBROID TUMOR OF THE UTERUS.

Fibroids and Heart-disease.—[Bleeding uterine fibroids may cause more or less acute anemia, but hemorrhage, as Brosin has shown, does not necessarily cause heart-disease. In bleeding cancers it was found that the heart often remained remarkably strong. In any case of fibroid with cardiac symptoms we must make allowance for, possibly, coincident heart-disease, for medication, and also for bulkiness of the tumor embarrassing the circulation. Pressure on the ureters may indirectly affect the heart by causing renal disease.] Alban Doran² states that deaths which may occur suddenly after the removal of a fibroid of large proportions have occasionally been traced on postmortem evidence to cardiac degeneration. It is known that the heart may fail on occasion, following the removal of any large tumor. To counteract the danger of heart-

¹ Am. Gyn., vol. i, No. 1, 1902.

² Brit. Jour. Obstet., Jan., 1903.

failure spartein answers in some cases in which the kidneys are involved, but strychnin is universally acknowledged to be the best drug for this purpose. This latter, however, is useless, if sepsis establishes itself. The practical value of considering the heart in relation to fibroids and hysterectomy is that we are often called upon to distinguish shock, both from hemorrhage and sepsis. The author does think that it is well to attribute all bad pulse conditions to heart-disease due to fibroids. After the removal of a large tumor a patient may have palpitations. Circulatory troubles are certainly observed in cases of fibroids in which only moderate hemorrhage or no bleeding at all exists. Syncope during the period (which was free though never severe) occurred in a case in which the author removed a fibroid uterus. Pain must be taken into account as well as free bleeding when the patient with fibroids has fainting fits during the period. It has been the author's experience that irregular pulses and attacks of syncope do not in themselves contraindicate operation; indeed, the patient is all the better for the removal of the tumor. Other forms of heart-disease may complicate fibroids. The common valvular changes when compensation has failed do not entail much extra danger, and the removal of a bulky fibroid proves rather beneficial under the circumstances. On the other hand, chronic Bright's disease, with a dilated heart, greatly increases the risk of hysterectomy.

Degenerations and Complications of Fibroid Tumors.—C. P. Noble,¹ after making a statistical study of 258 cases of fibroid tumors in his own experience, with their degenerations and complications, and reviewing the reports of C. J. Cullingworth, C. C. Frederick, and A. Martin, upon a series of numerous cases, concludes that it is a conservative statement that upward of two-thirds of women having fibroid tumors will die if not subjected to operation. The contrast with the results which can be secured by operation is very striking. It probably will not be disputed that the mortality of myomectomy and hysterectomy is between 2 % and 10 %, depending upon the gravity of the case, upon the operator, and upon the environment in which the operations are done. It seems a fair conclusion that the resort to early operation will effect a saving of from 25 % to 30 % in mortality, in addition to the perhaps greater saving in the morbidity which follows operation, as compared with that which is incident to the history of fibroid tumors. Early operation in the case of young women having one fibroid or a few small fibroids affords the truest opportunity for conservatism by curing these women of their disease and at the same time retaining their organs of reproduction. It seems to him that the attitude of the text-books should be reversed, and that the rule of practice should be to remove all fibroids which come under observation, unless in a particular case there seems to be some good reason for temporizing, due either to the small size of the tumor, or to the advanced age, or to the general health of the patient. Cullingworth² reports 100 cases of operations for uterine fibromyomas, in 52 of which the specimens showed more or less evidence of degenerative changes. Of these, 27 were myomatous, 5 fibrocystic, 18 necrotic, 1 sarcomatous,

¹ Am. Gyn., April, 1903.

² Jour. Obstet. and Gyn. of Brit. Emp., 1902, No. 1.

and 1 calcareous. The writer lays especial stress upon the age of the patient, myxomatous degeneration being most common between 42 and 52, while necrosis was noted in patients between 36 and 46 years of age. Pain was a marked symptom in 38 cases, especially in connection with necrosis and cystic degeneration.

Malignant Uterine Fibroids.—Ulesko-Stroganowa¹ claims to have established the fact that there is a true malignant fibroid, the leiomyoma malignum of several authors, and that it is commoner than has hitherto been supposed. The changes originate in the smooth-muscle cells, the essential part of the tumor. On the other hand, sarcomatous degeneration of a myoma is very rare, and the author has never detected this condition in any malignant fibroid. As a malignant myoma advances it assumes the appearance of a mixed sarcoma, yet in every case the transition from a muscle-cell to a round or spindle cell can be traced. The walls of the bloodvessels share in the malignant degeneration. In discussing the subject, Massen believes that this malignant change accounts for the sudden growth which a fibroid sometimes undergoes at the menopause. Litschkus insists that this malignant degeneration must force us to practise hysterectomy and abandon the supracervical operation. Fenomenoff asks Ulesko-Stroganowa if malignancy can be recognized at an operation. In reply it is stated that it cannot be recognized without the aid of the microscope; 100 cases of fibroid examined by the author included 10 in which malignant degeneration was detected.

The Cases of Uterine Fibroids treated at the Gynecologic Clinic in Zurich in the Last 13 Years.—Schwarzenbach² analyzes the 393 cases which entered the gynecologic clinic of the University of Zurich during the last 13 years. Flowing and pain were complained of in 345 cases, flowing alone in 116, and pain alone in 86. Urinary symptoms were present in 108 cases. Sterility was a frequent cause of the patients applying for treatment. Among 297 married women, 80 were sterile, or 26.9 %. A majority of the women were between 35 and 55 years of age; 261 cases were treated by laparotomy. Castration was practised in 19 cases, with 3 deaths. In 5 of the successful cases who were traced for from 6 to 12 years, the results were satisfactory, that is, the patients were relieved of flowing and the tumors diminished in size. Myomectomy was practised on 87, with 13 deaths. Of these, 35 were castrated at the same time the myomectomy was done and 52 were not. In 18 the uterine cavity was opened. In one case of myomectomy with castration it was necessary to do a supravaginal amputation 7 years later, because of the development of another fibroid. In those treated by myomectomy without castration the flowing was lessened, especially in the two years following operation, and all the patients traced expressed themselves as pleased with the results, and in every case the uterus was found either of the same size or smaller than immediately after the operation. One of the patients who had a fibroid the size of a man's fist in the fundus uteri gave birth to a healthy child 15 months after

¹ Monats. f. Geb. u. Gyn., Sept., 1902.

² Beiträge Zur. Geb. u. Gynäk., Bd. vi, H. 1, 1902.

operation. Previous to the operation she had had one child, and one abortion at 3 months. Supravaginal amputation was practised on 109 cases. Up to 1892 the extraperitoneal method of treating the stump was used, with a mortality of 37.5 %. After 1892 the intraperitoneal method was used, with a mortality of 7.8 %. Total hysterectomy was done only when supravaginal amputation was not practicable. There were 46 cases, with a mortality of 23.9 %. It is to be said, however, that of these 46 cases, 31 were done in the year 1900 by improved methods, with a mortality of 12.6 % only. The author concludes that the supravaginal amputation is the operation of choice when myomectomy without castration cannot be done. He thinks that a majority of the patients came to operation too late; that on account of anemia, weak or fatty heart, the system is often unable to successfully combat infection, when with a sound heart and the blood in good condition the result is very different.

Iodipin in Cases of Uterine Fibroid.—J. A. Shaw-Mackenzie¹ has tested the value of iodipin as a remedy for uterine fibroids in 2 cases, and reports the results, hoping to lead others to similar experiments. Both were instances of large movable fibroids reaching to the umbilicus. The treatment in the second case was by hypodermic injection of 2 cc. of iodipin (25 % in strength) into the cellular tissue of the buttock and continued injection daily for 10 days on alternate sides, doubling the dose on the fifth day. On the sixth day the tumor was 2 fingerbreadths below the umbilicus, and the right lobe was easily defined. On the tenth day the patient went out of town feeling very well; but returned on the nineteenth day, the tumor being much swollen again. The treatment was renewed, the dose increased in amount, and continued for several weeks with marked improvement, and in about 2 months' time she appeared restored to excellent health. The tumor and lobe could still be felt, but deep palpation was required to make them out. Although the reduction in the size of the tumor in the first case was not as remarkable as in the second, still there was a very decided improvement. This treatment does not confine the patient to bed or the house, nor is there apparently any disagreeable effect.

Myomectomy Versus Hysterectomy.—A. McCosh² remarks that in fibromas of the uterus less progress has been made in the direction of preservation of organs than in other lesions of the pelvis. There is no question as to the advisability of conservative surgery in those cases in which the fibroids are small and the organ is not extensively involved; but when there is severe hemorrhage and pain, and the fibroids are large, hysterectomy is commonly advised. The writer's judgment is toward conservatism in these operations. If an operation for the removal of a uterine fibroid involved the extirpation of the organ, extreme conservatism should govern the operator. In cases, however, in which the organ can be left, operation may be entered upon with more assurance. For the removal of uterine fibroids the vaginal route offers in a certain number of cases a suitable approach. If the tumors are subserous, small, and not very numerous, the uterine body can without much difficulty be

¹ Lancet, April 4, 1903.

² Med. News, Sept. 27, 1902, p. 577.

turned into the vagina through an incision anterior or posterior to the cervix and the tumors extirpated. A disadvantage of the vaginal route is that there is less opportunity offered for thorough inspection of the pelvic organs and less facility in performing the operation. The usual method of reaching these tumors is through the abdomen. The uterus is brought into the wound and a careful examination made to demonstrate whether it is possible to remove all the tumors, and yet leave sufficient uterine tissue to form a useful organ. The mere fact that the tumor is interstitial or submucous should not have weight in favor of hysterectomy. The size and number of the tumors may also be more or less disregarded.

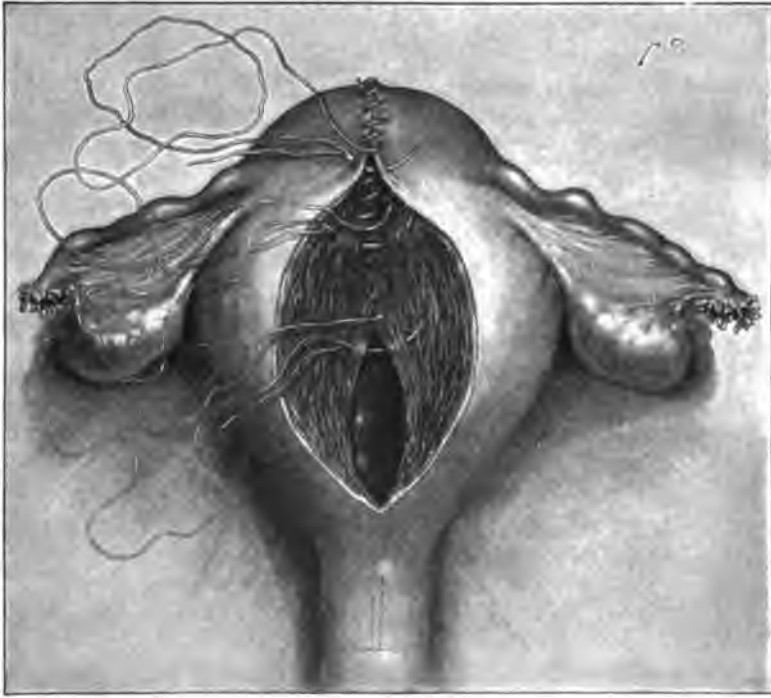


Fig. 94.—Showing suture of uterus after removal of fibroids (McCosh, in *Med. News*, Sept. 27, 1902).

The cases in which myomectomy is impracticable are those in which the uterus is infiltrated with scores of small fibroids extending into the broad ligament. There are cases in which the tumors are of very large size, in which hysterectomy must be the operation of choice. In McCosh's experience, tumors weighing 6, 8, and 10 pounds have been removed, and frequently their number has exceeded 20, without sacrificing the body of the uterus. He gives illustrations showing the method of suturing the uterus after the operation of myomectomy (Figs. 94 and 95). In conclusion McCosh says that in young women with uterine fibroids demanding removal, myomectomy should always be the operation of

choice. This operation is possible in the great majority of cases of fibroids. The operation is one that requires the strictest asepsis, and there is about the same danger to life that there is in hysterectomy. The ultimate results in relation to pain and pregnancy are satisfactory. Martin¹ emphasizes the fact that since the indications for myomectomy have been so much extended it is important to select a method of operation which gives the best remote as well as immediate results. He is strongly in favor of the vaginal route. The size of the tumor is not in itself a contraindication, since growths of large size can readily be removed through the vagina by morcellation. On the other hand, in the

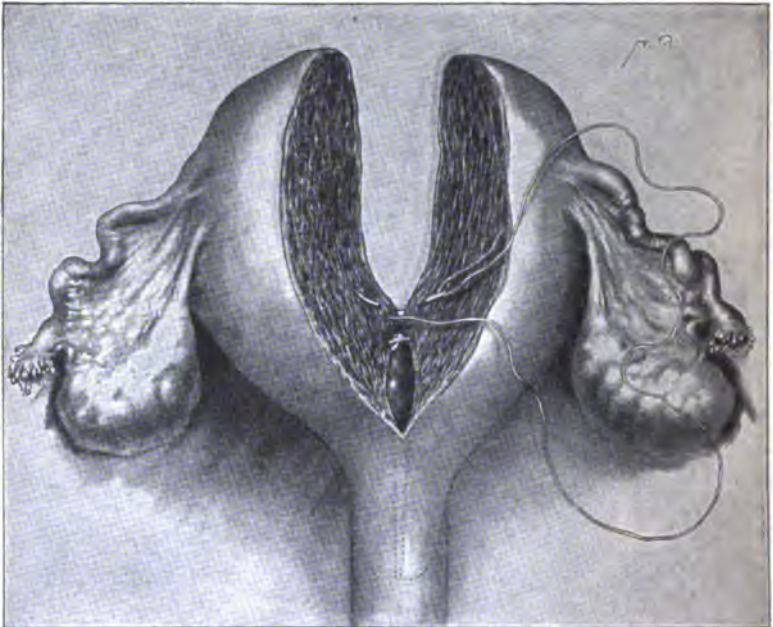


Fig. 95.—Uterus divided as far as internal os. Commencement of suture after trimming of uterine walls (McCosh, in *Med. News*, Sept. 27, 1902).

presence of firm suprapelvic adhesions, especially intestinal, the abdominal route is preferable; but deep pelvic adhesions and intraligamentary tumors are best handled from below. Martin fears injuries to the bladder and ureter more than he does hemorrhage, especially the former. He has never injured the ureters during vaginal myomectomy, though this accident has frequently occurred in his abdominal operations. When it is possible, he enucleates tumors without removing the uterus. In young women he tries to leave one ovary. The writer reports the results of his work during 3 years at the Greifswald clinic—87 vaginal and 31 abdominal myomectomies. The latter were all complicated, and 6

¹ *Zent. f. Gynäk.*, 1902, No. 14.

terminated fatally. Of the vaginal operations, 35 were total hysterectomies, with no deaths, and 52 were enucleations, with 2 deaths.

Hysterectomy for Fibroids.—The operative records of 50 cases of abdominal hysterectomy for fibroids is given by C. J. Pond,¹ from which he draws the following deductions: The position as to operation depends on the danger to life and the degree of displacement, of ill health and of suffering caused by the disease. The social condition of the patient is a factor. Comfortable invalid life is incompatible with poverty; therefore the disease must be removed among the poor, in order to return them to a working capacity. Among the more wealthy classes, moral, mental, and physical degeneration follow long-continued invalidism, which would be good grounds for operation, when other conditions permit. Whenever the disease causes displacement, hemorrhage, pain, and pressure sufficiently severe to threaten damage to the general health, to the nervous system, or to the pelvic organs, the operation should be advised. Cervical hysterectomy has a lower mortality (about 4 %) and is preferable to ovariectomy in this particular. The uterus may safely be impacted at this level, and the absence of recurrence in the cervix is an argument for this form as against panhysterectomy. In the former the pelvic floor is left intact; in the latter it is damaged. Myomectomy is a valuable operation, and applicable for certain accessible tumors. In all possible cases one or both ovaries should be left intact and not removed. Convalescence is more complete and the patient has no artificial menopause.

Superperitoneal Hysterectomy.—Moullin,² having secured the ovarian arteries with a double ligature, cuts between them and extends the incision as far down as need be through that portion of the broad ligament which is free from vessels, and then carries it across the face of the tumor to the opposite side above the bladder, which is stripped down out of the way. The uterine artery is ligated as close as possible to the cervix and a clamp placed over the ligature. The amputation should be at the lowest possible level, the artery being cut below the point at which it divides. There is no necessity to strip the peritoneum from the back of the uterus in order to make a posterior flap. After suturing the stump with chromicized catgut he draws the anterior flap and the bladder completely over its face and fastens it with a continuous suture from one side of the pelvis to the other. The strength of the parietes depends entirely on the fascia. There must be accurate adaptation and firm union. The aponeurosis splits to form the sheath of the rectus on each side. In the lower two-thirds the strongest layer lies in front, the upper third behind the muscle. The former is separated from the peritoneum by cellular tissue and fat, the latter is closely attached. In the lower part he sutures peritoneum, fascia, and skin separately; above he makes only two layers of sutures. In hernia the edges of the aponeurosis must be sought by carrying the incision above and below, the scar-tissue removed, and the edges approximated.

¹ *Lancet*, Jan. 17, 1903.

² *Med. Press and Circ.*, Jan. 29, 1903.

SARCOMA OF THE UTERUS.

Sarcoma of the Uterine Parenchyma.—[Sarcoma arising in and developing from the myometrium as a multinodular newgrowth of the uterus is a very rare and, from a clinical and pathologic standpoint, one of the most interesting diseases of the female genital tract.] Henry D. Beyea¹ was unable to find more than 70 or 80 such cases in the literature. It would seem that no accurate clinical study of this class of uterine sarcomas had been made. Their histogenesis is undetermined and is a question which has led to much discussion. Some investigators believe that they arise through a metaplasia of the muscle-cells of a preexisting myoma of the uterus and are myosarcoma; others, that they arise in the connective-tissue cell of such a tumor; still others, that they are primary sarcomas of the myometrium. It would seem probable that the first theory was the correct one; possibly some arise from the connective tissue and others from the myometrium. The author reports a case in which the histogenesis was most doubtful and impossible to determine. Knott² has collected 118 cases, the average age of the patients being 37 years. In 40 cases the disease developed in the muscular wall of the uterus, in 33 in the endometrium, and in 29 the cervix was primarily affected. Attention is called to the frequency of sarcomatous degeneration of fibromyomas, especially cervical polypi. Pain, hemorrhage, and a watery discharge are the initial symptoms, cachexia being a late manifestation. The prognosis is bad. The mortality in 86 cases after total extirpation of the uterus was over 60 %. Pulmonary metastases are most to be feared.

MALIGNANT DISEASE OF THE UTERUS.

Adenomyoma of the Uterus.—An editorial in "American Medicine"³ remarks that in that department the journal has repeatedly called attention to the importance and difficulty of early diagnosis of uterine carcinoma, and emphasized the necessity for more careful clinical study of the symptoms of this insidious disease. Hemorrhage from the genital tract after the menopause is almost invariably indicative of incipient malignant disease and demands careful investigation. The recognition of malignant disease of the body of the uterus presents unusual difficulty: it is only by a dilation and intrauterine exploration that we can be certain of our diagnosis, and often the clinical examination must be followed by a microscopic test. Operators have frequently seen advanced adenocarcinoma of the body of the uterus without any change in the size or symmetry of the organ, or any evidence apparent on the ordinary bimanual examination. And there has recently been reported one case in which the presence of a small adenomyoma presented the same perplexing problem in differential diagnosis. One of the most interesting additions to gynecologic pathology during the past year was a contribution to the Philadelphia

¹ Am. Jour. Obstet., Feb., 1903.

² Ann. of Surg., 1901, No. 2.

³ July 5, 1902.

Obstetric Society by T. S. Cullen, of Baltimore. In the examination of over 700 cases of uterine myoma at the Johns Hopkins Hospital, he found 19 specimens of adenomyoma. Many of these were detected in the early stages, and hence the very beginnings could be followed. Cullen divides these growths into 3 main groups: (1) Those in which the uterus preserves a relatively normal contour; (2) subperitoneal or intraligamentary adenomyomas; (3) submucous adenomyomas. In discussing the origin of these neoplasms, he observed that formerly the majority of writers thought that they were due to remnants of the wolffian duct, but now the consensus of opinion is that the greater number at least are derived either from the uterine mucosa or from a portion of Müller's duct. In over half of his cases the uterine mucosa could be seen extending by continuity into the adenomyoma, demonstrating beyond peradventure their origin from the mucosa. In the second place, in no other part of the body, either in the embryo or in the adult, do we find glands resembling uterine glands and surrounded by characteristic stroma, and, furthermore, the wolffian body contains no structures that can be mistaken for uterine glands. The uterine mucosa is, as Säger taught his students, a definite organ and has a well-defined function to fulfil. This function is seen in practically every case of adenomyoma. Adenomyomas are usually detected during the child-bearing period and give rise to menstrual disturbance varying from a few months to 10 years or more. The periods are usually more profuse and painful, but between periods there is, as a rule, little or no discharge. In 15 cases reported by Cullen the patients were married, and of this number 9 had had children. In the first group the uterus may be normal in size, but as a rule is 2 or 3 times as large as normal. It is globular in form, and often slightly irregular in outline, due to small discrete myomas which are often present. The appendages show a peculiar tendency to become adherent, and the uterus is often fixed by dense bands of inflammatory tissue. A sound introduced into the uterus will give no clue, and curettings will invariably yield nothing but normal mucosa. We thus see that while we have some clue from the slow increase in size of the organ and the profuse menstrual period, yet no diagnosis can be made until the organ is removed. The subperitoneal and intraligamentary adenomyomas cannot possibly be differentiated from ordinary myomas, sarcomas, or obscure cysts until removal, and the submucous variety offers no points of clinical variation from submucous myomas. The prognosis in these cases is very favorable, provided the uterus is removed before pressure-symptoms have developed. [It is particularly between the first group of cases and uterine carcinoma of the body of the uterus that there will be difficulty in the diagnosis, and we use this contribution as an additional argument in favor of more frequent vaginal examinations during the fourth decade, and a more rigid determination to know the cause for all unusual bleeding or menstrual disturbance, even if in doubtful cases it requires intrauterine and microscopic investigation.]

The Statistics of Cervical Carcinoma.—Dorland¹ claims that the

¹ Phila. Med. Jour., Oct. 4, 1902.

recently published statements of men of such national repute as Frederick, of Buffalo; Baldy, of Philadelphia; McMonigle, of San Francisco, and others, concerning the results of their operations upon cervical cancer must command the close attention of all gynecologists. Our knowledge of the extreme fatality attendant upon this condition has been a matter of gradual development. Twenty years ago it was taught in the medical schools that of the patients suffering from cancer of the cervix, if seen early enough, a cure could be wrought by high amputation of the cervix. The constant and almost inevitable recurrence after this method of treatment led to an abandoning of the operation, and resulted in the general adoption of the operation of total extirpation of the uterus. While with this advance there followed a diminished frequency of early recurrence, sooner or later the disease reappeared, and other steps were required to insure, if possible, a nonrecurrence of the growth. Then arose the school of theorists who claimed that the recurrence was due to an invasion of the lymph-glands of the pelvis, and that, in order to arrest the progress of the disease absolutely, these glands must be totally eradicated. In prolonged operations efforts were made to trace the lymph-channels to their finest radicles, and the broad ligaments and pelvic contents were, as far as possible, removed *in toto*. It required but a couple of years to prove the futility of these methods. The disease still recurred, and it dawned upon the minds of the theorists, as it had already been clearly evident to the more practical, that no one could say when the glands had all been removed. The final surrender of the operators followed 2 years ago. At the St. Paul meeting of the American Medical Association, Baldy stated that all of his cervical cancer patients were dead. Following this bold leader the others fell into line and admitted that their results had not been as satisfactory as they would wish them to be. At Saratoga, Frederick made the alarming but probably correct statement that the condition was a fatal one, and supported his avowal by the statistics of McMonigle, of San Francisco, who, in 481 hysterectomies for carcinoma, had had 479 deaths from the primary operation or from recurrence. Such is the present status of affairs. To all intents cancer of the uterine cervix is, with the exception of an extremely small percentage of doubtful cases, an incurable and rapidly fatal condition.

Age-limit in Uterine Carcinoma.—An editorial in "American Medicine"¹ remarks that although the maximum incidence for the occurrence of carcinoma of the uterus is between the fortieth and fiftieth years, yet the possibility of its development earlier should not be overlooked, and probably should be more frequently emphasized. This fact has been brought strongly to our notice recently by the observation within 3 months of 3 patients suffering from well-advanced cervical cancer before 30 years of age. In two of them the disease was so extensive as to contraindicate surgical interference. As we have repeatedly said, eternal vigilance is required for the early diagnosis of this insidious disease; and these cases in point indicate the necessity for careful exam-

¹ June 20, 1903.

ination and early operation in bad lacerations of the cervix; for it is extremely rare for a nulliparous woman to suffer from cervical cancer unless she has been subjected to some operation or instrumental treatment. When the disease occurs early during the period of sexual activity, its extension is very rapid and recurrence almost inevitable, so that we are confronted by the melancholy truism that we know little about, and can do little for, well-defined cases of uterine carcinoma. The chief prophylactic measure is the repair of lacerations of the cervix which are extensive enough to produce an eversion of the cervical mucous membrane, whether they are symptom-producing or not.

The Condition of the Pelvic Lymphatics in Uterine Carcinoma.

—Dorland,¹ says that to one who has studied the pelvic lymphatic system, its complexity and enormous ramification must appeal as most important elements in the prognosis of pelvic malignant disease. The immense numbers of individual glands, their frequent groupings and close intercommunication, must act as a rapid means of infection when there has been once established a focus of carcinomatous change in the cervix uteri. That this glandular extension is rapid and ineradicable is amply proved by the published statements of such eminent pelvic surgeons as Baldy, McMonigle, and others. These men claim that sooner or later after hysterectomy for cervical carcinoma a recurrence will inevitably take place, and they regard the condition as a fatal one. McMonigle publishes a remarkable record of 481 vaginal hysterectomies with 478 deaths occurring either primarily or, for the most part, from recurrence in the pelvic glandular structures. A noteworthy feature of the recurrence is that in the vast majority of cases it takes place below the cervix, thus showing the inefficacy of the attempt at eradication of the pelvic glands. To the magnificent work of Emil Ries, of Chicago, must be attributed most of our present knowledge of the changes that occur in the pelvic glands in uterine carcinoma. He has made this field of the pelvic morbid anatomy his special domain, and has elicited much valuable information for general use. During the past 8 years he has endeavored to remove the pelvic glands in carcinomatous cases, and has always subjected the extirpated glands to careful microscopic examination. His investigations have covered 10 cases of cervical carcinoma and over 20,000 sections, the work having been a personal one. He concludes that invasion of the glands occurs early and inevitably. An interesting discovery is that the invasion does not proceed from gland to gland consecutively, but that the carcinomatous emboli overleap some of the glandular links and lodge in glands well beyond the primary seat of the disease. There may accordingly exist a number of absolutely healthy glands between the primary and the secondary foci of the disease. Again, it has been found that glandular enlargement does not necessarily indicate a cancerous change. The enlargement may be purely irritative in origin. Another feature discovered by Ries, and one that has not been adequately explained, is the frequent presence of a large-cell hyperplasia. Large, clear cells with distinct and prominent nuclei may be

¹ Phila. Med. Jour., June 6, 1903.

noted among the thickly crowded leukocytes in the glandular tissue. The same condition has been observed in tuberculosis, and is not, therefore, pathognomonic of carcinoma. Ries has also concluded from his studies that a constant fluctuation is taking place in the lymphatic system during pathologic processes. As certain of the glands lose their function because of the development in them of pathogenic changes, new glands are formed at any point in the connective tissue. The logical deduction of these investigations is that in all cases of cervical carcinoma the pelvic glands should be totally extirpated. The practical conclusion of most gynecologists is that this much-to-be-desired result is impossible. It is futile to endeavor to remove the glands *in toto*; some more or less remote will be left behind, and in these glandular vestiges sooner or later recurrence is bound to take place. In a Vienna hospital a histologic and pathologic study was made of the lymph-glands removed in 141 cases of uterine carcinoma. Wertheim¹ states that in 35 % of these cases the glands had been attacked by the cancer. In nearly all of these they were more or less enlarged; but the long, spindle-formed, very thin glands which lie between and near the large vessels showed no signs of carcinoma. About 30 % of the cases showed enlarged glands, although no evidences of carcinoma could be detected, the enlargement being due to hyperplasia and infiltration. The region most frequently affected was that between the external and internal iliac arteries and the inguinal region, toward the obturator foramen. In the other third of the cases there was not the polymorphic, alveolar formation of the others, but tubular, cylindric, often cystic cells with mucus-filled spaces. Wertheim describes in detail the formation of these glands; and in order to answer the question whether there was any causal connection between their formation and the presence of uterine cancer, he had two of his pupils examine the lymph-glands taken from 80 corpses without any cancer, and in none of these was there a like condition found. Hence he concludes that where the peculiar cell-structure described occurs in the lymph-glands we have to do, not with anything caused by disturbance of development, but with metastases of uterine cancer.

Clinical Aspects of Carcinoma in Women.—W. J. Sinclair,² in his address in obstetrics at the annual meeting of the British Medical Association, draws a contrast between pathologic and clinical work which is not particularly flattering to the former, stating, however, that pathology has not been misleading to the gynecologist, for he has never trusted to its guidance. He reviews the older pathology, particularly the work of Hegar, and lays especial stress upon the necessity for preventing irritation, maintaining nutrition, studying individual characteristics, occupation and time of life, and avoidance of infection, as far as possible, from such diseases as lues and gonorrhea. He considers that recent investigations have shaken, if not shattered, the whole blastodermic theory. He refers to the parasitic theory, calling attention to the work of Gaylord, on the one hand, and the report of the Cancer Commission of the Harvard Medical School on the other, the latter body concluding that the

¹ Zent. f. Gynäk., Jan. 24, 1903.

² Lancet, Aug. 9, 1902.

work done during the past two years in the study of the etiology of cancer has been wholly negative in its results in the sense that an increasing doubt has been thrown upon the parasitic origin of the disease and upon the pathologic significance of the so-called cell-inclusion. Sinclair believes that we have heard too much of cancer as a neoplasm and too little of it as a disease. If we set aside all consideration of etiology and pathology and keep in mind only the clinical aspects of the disease, much has been achieved in the last quarter of a century. The clinical work has been wholly surgical; what is not surgical is futile; it is hardly knowledge. So far from the pessimistic view being the true view, the results obtained by many of the best known operators continue to improve and to give the greatest encouragement for continued effort in the future. They are obtaining better immediate results and the number of "cures" increases—that is, the percentage of immunity for at least 5 years after operation becomes greater. The percentage of cases operable when first seen also increases, because the patients come earlier for treatment, and improvements in technic have extended the indications. The proof of all this lies in the statistics of carefully reported work done under circumstances in which the sources of error are reduced to the minimum. Sinclair has no hesitation in saying that a large number of the extended, radical abdominal hysterectomies for cancer are murderous vivisection which nothing hitherto advanced in their support appears to palliate, much less to justify. Most of the cases recorded have been too far advanced for any operation, however radical. The immediate mortality is terrific and the proceeding unjustifiable, as the experience of remoter results shows that the patients who escape with their lives from the operation are no better off in relation to recurrence than those who have undergone the comparatively safe operation of vaginal extirpation. Cancer of the cervix occurs almost exclusively among the prolific poor, the chronically overworked and underfed, harassed, drained women, who have fissures of the cervix, neglected lacerations, venereal diseases, and remnants of puerperal sepsis. It is a different disease from cancer of the body and is bound to decrease as the social condition, the physical well-being, and the consequent comparative happiness of the people improve. Hope of immediate amelioration must rest upon surgery. The general practitioner must be trained to make an early diagnosis of the disease. He asserts that the presence of friable tissue in the cervix uteri indicates the existence of disease which is clinically malignant whatever the microscope may say, and concludes with the statement that if we are ever to arrive at the causation of carcinoma of the uterus we must reach it by the rigid application of logical methods of induction to clinical work. [This scholarly address is convincing that in the present nebulous state of knowledge upon the etiology of carcinoma the first practical and active duty is to make an early diagnosis of the disease; and Knowsley Thornton, in an address given before this same association in 1895, states that an early diagnosis of malignant disease of the uterus can only be made by clearly neglecting no menstrual departure from the normal, however trivial it may be at

first appearance, by encouraging the patient to describe accurately her symptoms, and, above all, by insisting in the most determined manner upon a local examination.]

Mortality from Cancer.—J. M. Baldy¹ remarks that but 5 % or less of all cases of cancer of the cervix uteri presenting themselves for treatment were cured, and that some of these cures were doubtful. For this analysis he used the statistics of the Johns Hopkins Hospital, the most reliable and complete as yet presented in this country. Of 141 cases presenting themselves for treatment, but 15 remained alive after 6 years, some of the patients having died as late as 5 years after operation. The time was when Volkmann laid down the dictum that after removal, after 2 years of freedom from recurrence or metastases, a permanent cure was usual, and that after 3 years, without exception, such a cure was certain to be the case. This became the universal belief, and is to-day the cause of the claim of from 20 % to 50 % of cures. We now know this to be untrue. Labhardt collected 112 cases of late recurrence, *i. e.*, after the third year. He found that the majority of these occurred in the fourth to the sixth year after the operation, and he even cites cases of recurrence in the fourteenth to the twentieth year. He substantiates the fact that these were cases of recurrence by showing that they all developed as local growths in the scar from the operation. Not only is there an indefinite period in which recurrence may take place, as stated by Duplay, but Labhardt states that there was a late period of metastasis as well in his collected cases. Certainly, in view of all these facts, we cannot consider a patient cured under 6 years.

Treatment of Inoperable Cancer of the Uterus.—Cucca and Ungaro² use the following solution: Methyl-blue, 90 grains; 90 % alcohol and glycerin, ãã 3 drams; water, 7 ounces. This is applied to the diseased cervix on tampons after previous curetting. A weaker solution is used for vaginal and intrauterine irrigation. The results have been quite satisfactory, patients being kept comfortable and free from hemorrhage and discharge for months, or even years. Pain was relieved so that morphin could be dispensed with, and the progress of the disease was evidently retarded. No unpleasant effects were noted after prolonged use of the remedy. Bramon³ speaks highly of the following method of treating inoperable cancer of the uterus and vagina, adopted by Horwitz: A few days after curetment and tamponade with gauze the spray of methylene-blue is applied to the diseased surface for from 1 to 5 minutes, or until it has been handled several times. The treatment is repeated in 3 days, and is continued subsequently at longer intervals. Healthy granulations form, and in time new epithelium develops. The patient's general condition improves and menstruation becomes normal. Bramon has observed that under this treatment a uterus which had previously been fixed may become movable, probably due to the absorption of inflammatory exudate. At the previous meeting of the Italian Surgical Society⁴ Mariani reported 2

¹ Phila. Med. Jour., Oct. 4, 1902.

² Zent. f. Gynäk., No. 22, 1902.

³ Arch. de Méd. et de Chir. Spec.; La Gynakologie, April 15, 1902.

⁴ Il Policlinico Supplemento Settimanale, April 12, 1902.

cases of inoperable uterine cancer cured by the endovenous injection of quinin (*Jaboulay's treatment*). He began by injecting a dose of 25 cgr. of quinin hydrochlorate, after a time giving hypodermatic injections of 50 cgr. To one woman he gave 35 injections, to the other 30 in 3 months; in the latter case the drug was given by the mouth for the last 5 days of the treatment. A fortnight's interval was allowed in the middle of the course. In one case pain and metrorrhagia ceased and the ulcer completely healed; in the other it healed to a large extent. Examination of the blood before and after treatment showed that in one case leukocytosis had entirely disappeared, and in the other had greatly diminished. Histologic examination of tissue removed 2½ months after the conclusion of the treatment showed in one case not a trace of epithelioma; in the other epitheliomatous structure was apparent. With regard to the action of the remedy, the author is inclined to believe that it is due to the antiseptic properties of the drug, acting either directly on the microorganisms or neutralizing the toxins produced in the cancerous tissues. In the discussion Salomoin said he had used the method in 3 cases. In one—an adenoma-carcinoma of the kidney—the result was good; he thinks, however, that there was an error of diagnosis, although the diagnosis was made after an exploratory incision. In the other two cases—an epithelioma of the lower lip and an osteosarcoma of the lower jaw—the result was negative. Durante said he believed that quinin might act on the area of leukocytic infiltration which accompanies malignant tumors, especially if there is ulceration. But he does not think there is any ground for looking upon the drug as a means of radical cure. Tansini had used quinin in a case of inoperable cancer of the breast, with the result that the evolution of the growth proceeded more rapidly than before.

The ligation of the hypogastric and ovarian arteries on both sides is advocated by Krönig¹ in palliative treatment of uterine carcinoma. In inoperable cancer the cauterization of the cancerous mass often fails to check the bloody or putrid discharge, and the desired result is better secured by such ligation, which can be best accomplished through a small transperitoneal incision between the navel and symphysis. With this method there is little loss of blood and a brief convalescence. It is best to ligate the hypogastric artery at its point of departure from the common iliac artery, and the ovarian at its entrance into the broad ligament. In suitable cases this procedure may be combined with the cauterization of the cancer. He thinks the ligation of these arteries is indicated in all cases in which, after opening the abdomen, it is found inadvisable to perform a radical operation.

Operative Treatment of Carcinoma.—T. Wilson² remarks that the improved results that have been obtained by Halsted's method of operation in the treatment of cancer of the breast is stimulating gynecologists to the endeavor to find a safe operation that shall be attended by similarly improved results in cancer of the uterus. A. Mackenrodt³ states that at

¹ Zent. f. Gynäk., Oct. 11, 1902.

² Canad. Jour. of Med. and Surg., Sept., 1902.

³ Zeit. f. Geb. u. Gyn., Bd. xlv, No. 1, 1901.

the Giessen Congress it was shown that by vaginal hysterectomy a definite cure can be obtained in about 32 % to 40 % of operable cases, and in 10 % to 12 % of all patients seeking advice for carcinoma of the uterus. These results, as regards cancer, must be considered relatively favorable, but they do not appear satisfactory to many gynecologists. A more radical operation must be based upon ascertained anatomic and pathologic facts. As regards the pathology of uterine cancer, it is important to note that the pelvic connective tissue is early implicated, and that often there is early infection of the pelvic glands. The paravaginal connective tissue can be almost completely removed through the vagina with the help in certain cases of a vaginoperineal incision, or of a paravaginal incision, as in Schuchardt's method. By the latter method Schuchardt has obtained, in a material showing 62 % of operable cases, a definite cure in 24.5 %. Mackenrodt states that Schuchardt, in his operations, has paid no attention to the danger of infection of the fresh vaginal wound by cancer, and claims that he himself has obviated this danger by the use of the actual cautery in making the incisions. Igniextirpation of the uterus through the vagina has given, in Mackenrodt's hands, 42.8 % of lasting cures in a material showing an operable ratio of 92.9 %. The difference of 18 % of radical cures between his figures and those of Schuchardt, Mackenrodt ascribes to the avoidance of implantation-metastasis in his method. Preparatory cauterization of the central portion of the mass does not suffice to prevent cancer-infection of the operation-wound, because there is an equal likelihood of infection by pieces derived from the peripheral portion of the growth. Mackenrodt¹ believes that the complete removal of the pelvic connective tissue through the vagina is a practical impossibility, but he further asserts that in all the cases that have been sufficiently investigated by him a complete operation was anatomically possible and recurrence avoidable. The removal of the whole of the glands, and not only of those that are already obviously diseased, is necessary. Mackenrodt thinks that there is a possibility of obtaining radical cures in more than 50 % of cases of cancer of the uterus, and as in cancer there is everything to gain, and very little to lose by operating, the end to be aimed at is not good statistics, but the definite cure of as many patients as possible. Influenced by the above considerations, and being assured that a complete removal of the pelvic glands is from their anatomic relations feasible, Mackenrodt has sought for a suitable operative method. He found that the removal of the glands was not possible through a median lower abdominal incision, and the method he has arrived at after careful trial is a subperitoneal one carried out through a horse-shoe-shaped incision. The cancerous growth is prepared 2 days beforehand by curetting and packing with gauze soaked in 10 % formalin solution. The operation is briefly as follows: A vertical incision is made on each side along the lower part of the outer border of the rectus muscle. The lower ends of these incisions are joined by a transverse cut just above the pubes. The attachments of the recti to the pubes are divided. The peritoneum is pushed off unopened from the large abdominal flap, and

¹ Berl. klin. Woch., Sept. 11, 1902.

is cut across above the bladder. The uterus is then drawn up through the opening and its peritoneal attachment divided all round. The peritoneum separated from the anterior abdominal wall is next sutured to the peritoneum on the posterior pelvic wall from one side to the other. The peritoneal cavity is thus shut off above, while below the pelvis, with its contents, lies widely open. The peritoneum is now pushed off the lateral pelvic wall, and the glands are removed retroperitoneally as high as the bifurcation of the aorta. Finally, the uterus, and as much of the vagina as seems desirable, are removed. If the ureters are implicated in the growth, it is claimed that portions of them can be easily removed, and the ends implanted in the bladder. As regards the treatment of the wound left after removal of the uterus, in the first 5 patients operated upon in this way the whole enormous cavity was stuffed with iodoform gauze, and the parietal wound closed by sutures. Out of the 5 patients, 4 died from septic infection that undoubtedly arose from the vagina and the injured rectum. In several other cases the wound was divided into 4, the bladder being first sutured to the stump of the sacrouterine ligaments, and the lower compartment of the wound thus formed being drained into the vagina. The upper compartment was then divided into 3 by suturing a fold of peritoneum to each lateral border of the abdominal flap, and these 3 cavities were separately drained through the abdominal incision by tubes with gauze. After this method of treatment of the wound, healing proceeded smoothly in 6 cases.

The studies of J. A. Sampson¹ show that carcinoma of the cervix may form metastases in the small lymph-nodes among the vessels, and these nodes may have a diameter of not over 1 mm. to 1.5 mm. Owing to this small size, it may be impossible to feel these either in the parametrium or along the pelvic vessels, and they may be discovered only accidentally or by cutting serial sections. In every case of hysterectomy for carcinoma of the cervix the lymphatics along the pelvic vessels and also the parametrium should be removed *en masse* with the uterus, because an enlarged gland is not necessarily an invaded gland, and cancer may be present in very small lymph-nodes which cannot be palpated; therefore clinically it is impossible always to diagnose cancerous lymphatics. Should the ureter be adherent to the parametrium, the lower portion of it should be sacrificed and all the tissues from cervix to pelvic wall removed, for if the ureter is dissected free the disease will probably return and a ureterovaginal fistula will probably occur from injury to the blood-supply of the ureter. Following out these principles, the steps of the operation recommended by the author are: (1) A preliminary catheterization of the ureters with silk bougies before the patient is narcotized. (2) After the patient is narcotized she is placed in the perineal position and a long proctoscope is inserted into the rectum in order to get rid of any gas or fecal matter. (3) A row of interlocking sutures is now placed around the vagina 3 cm. below the growth. These sutures are passed with a large, curved needle, include large masses of tissue, and extend laterally as far as the needle will permit, while a

¹ Bull. Johns Hopkins Hosp., Dec., 1902.

finger in the rectum prevents their being passed too deeply posteriorly. After all these sutures have been passed, they are tied. (4) A retention-catheter is placed in the bladder. (5) The patient is now placed in the Trendelenburg posture and the abdomen opened from symphysis to umbilicus. After packing back the intestines with gauze, the ovary on the side on which the ureter is to be resected is grasped by a pair of forceps and pulled downward and outward so as to make taut the ovarian vessels and peritoneum covering the iliac vessels. The peritoneum is now split below and parallel to the ovarian vessels as high up as the origin of the internal iliac artery. Beginning at the origin of this, he dissects downward, removing the fat and lymphatic vessels from along the iliac vessels, thus exposing the branches and removing the tissue *en masse*. One should never dissect upward, for (a) the instrument may enter the angle between the branches of the iliac vessels and may tear off one, (b) by dissecting downward the fat and lymphatics can be removed *en masse*, (c) it is safer always to work from a more dangerous to a less dangerous region. After exposing the vessels down to the uterine artery, the ovarian vessels and round ligaments are cut. The uterine artery is tied twice at its origin, taking care to include in the ligature the vaginal artery, should it arise from the internal iliac, but not the superior vesical. (6) The other side is treated in a similar manner, if both ureters are to be removed; if not, the exposure of the vessels is the same and the removal of the lymphatics may be similar, and the uterine vessels are tied and cut at their origin, and then lifted up and dissected away from the ureter, taking care not to injure its outer, vascular coat. (7) The uterus is now pulled upward and the bladder dissected free from the cervix and not the cervix from the bladder, for in the former, while there is greater danger of injuring the bladder, there is less danger of cutting into the diseased cervix. The dissection is carried on down to the ureters, and, if thought best, one or both are cut off close to the bladder. (8) The ureter should be amputated just above the place where the uterine artery crosses it, and all the tissues lateral to the cervix, including the lower portion of the excised ureter may be dissected from the pelvic wall. If the lower end of the ureter is not to be sacrificed, the parametrium is dissected free mesially to the ureter. (9) The ureterosacral ligaments are next cut, and the rectum is dissected from the cervix and vagina. (10) The dissection is now carried on around the growth on all sides and down the vagina to the preliminary catgut ligatures. The gaping opening of the large veins can be seen in these cases, some thrombosed, and others empty, perfectly controlled by the preliminary catgut sutures. Wertheim's clamps are now applied to the vagina and the vagina is cut below them and the tissue removed. (11) The ureterovesical implantation. The operation at present takes 2½ to 3 hours, but is justifiable when one considers that after the ordinary operation recurrences were noted in 87.7 %; with greater experience no doubt the operation will be done more rapidly and thus the mortality considerably reduced.

Electrothermic Hysterectomy.—[In the treatment of cancer of

the uterus hemostasis has always been most important for those cases that do not stand the loss of blood well. Another important point in this disease is that we should hemostase in the tissues as far removed from the uterus as possible, with the view of going beyond the limits of malignancy.] A. J. Downes¹ insists that all malignant cells at the line of section should be killed; the lymphatics leading from this line should be sealed and rendered nonabsorptive. Electrothermic hemostasis alone can fulfill these requirements. The outfit for electrothermic hysterectomy consists of 3 angiotribes, all alike except in the size of the blades, which vary in width only (Figs. 96 and 97). The heating apparatus is

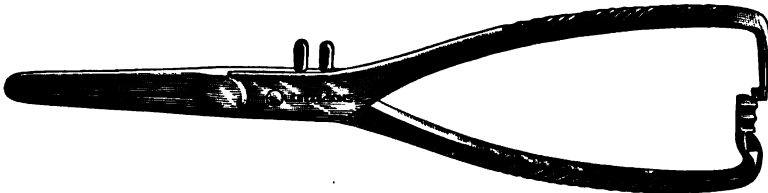


Fig. 96.—Downes's angiotribe with narrow blades, useful in hemostasis. It can be applied deep in the pelvis and as a hemorrhoidal forceps. The blades are released by pressure on the handles (Am. Gyn. Dec., 1902).

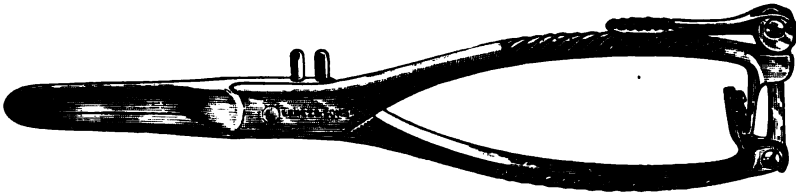


Fig. 97.—Downes's electrothermic angiotribe with blades $\frac{3}{8}$ or $\frac{1}{2}$ inch wide. Has a lever at end of handles to maintain maximum pressure. Blades released on removal of lever (Am. Gyn., Dec., 1902).

such that the acting blade can be brought to the proper temperature in from 10 to 20 seconds according to the size of the blades. The cable is made in two parts: one, which does not require sterilization and brings the current from the transformer to the operating-table; the other, flexible and covered with lava strips, can be sterilized and be placed with the instruments. They are connected at the edge of the operating-table. The author's knife is required. When there is no street current, a storage battery of 75 ampere hours' capacity when fully charged will give sufficient current for the 3 major operations. By this method the author has performed 5 hysterectomies for cancer. The forceps are applied as in the application of the angiotribe, and then the uterus is cut away by means of the electrocautery knife. The operations were less bloody than by the ligature method. As a type of operation that can be done by this method, it can be said that any hysterectomy that can be performed by ligature can more readily be done by electrothermic hemostasis. The writer thinks that any operation so practicable as

¹ Am. Gyn., Dec., 1902.

this method is worthy of serious consideration and should be given a fair and honest trial.

X-rays in Cancer of the Cervix.—At the ninety-seventh annual meeting of the Medical Society of the State of New York,¹ S. Scully (Rome, New York) said that the present treatment of cancer of the cervix uteri was rather discouraging. If found at an early stage, and complete hysterectomy were done, there was some hope of saving the patient's life. Nothing short of hysterectomy, however, gave the patient any hope. In later stages it was recognized that the cases were practically hopeless. Even under the most favorable circumstances, however, complete hysterectomy was followed by an alarming number of recurrences with fatal results. The first case that came under his attention after he had resolved to employ the x-rays was a so-called cauliflower growth of the cervix. A metal shield was used at first, but this produced electric induction difficulties, and was liable to cause local irritation. After the first employment of the x-rays the patient began to improve, and the growth gradually sloughed away. The tendency to hemorrhage ceased after a few applications, and other parts of the growth began to shrivel up. After a number of applications the woman felt so well that, as she was summoned to a distance by her daughter's confinement and serious illness, she gave up treatment, and had written that she considered herself cured. In the second case in which Scully employed them the x-rays at once gave relief from pain in urination, and relieved the discomfort which had existed for a long time. There had been a very offensive discharge, which began to diminish at once, and ceased entirely in a few weeks. At the date of the reports, as the result of some 15 applications of the x-rays, the cervix was practically obliterated, the patient had gained in weight, the ulcerating parts were healed over except at one portion of the posterior vaginal vault, and the outlook was most promising. The patient herself was very well satisfied with the results obtained, and there seemed to be every reason to think that the local condition at least had been obliterated. All cases treated had been benefited. Scully considered that while the present knowledge of the x-rays did not justify the putting off of operation in cases in which the disease had not advanced very far, the x-rays should be employed in most cases of cervical cancer. In advanced cases, where palliative operations were employed, this method should always be considered, even after hysterectomy. Treatment by the x-rays might prevent the development of recurrences.

AFFECTIONS OF THE PELVIC ORGANS.

Primary Carcinoma of the Fallopian Tube.—According to Graefe,² Orthmann reported the first sure case of primary tubal carcinoma in 1888. Subsequently Zangemeister published a table of 52 cases, but in 14 years few more have been added to this list. In comparison with ovarian and uterine cancer the tubal form is exceedingly rare. Graefe

¹ Med. News, Feb. 7, 1903.

² Zent. f. Gynäk., Dec. 20, 1902.

adds another to the list. When he first saw the patient he found an enlarged retroflexed uterus, a sausage-like tubal tumor the size of an orange, and a small mucous polyp hanging from the external os. The diagnosis was hydrosalpinx and pyosalpinx, and because of the blood-colored watery discharge the possibility of a tubal cancer was recognized. For this reason celiotomy was advised, but refused. Hydrastis was employed and a large Meyer's ring introduced, under which treatment the discharge ceased and the patient's general condition was much improved. When Graefe saw her 2 years later, for 3 months she had been suffering from a yellowish discharge and severe abdominal pains. The tubal tumor seemed unchanged, the uterus was smaller, and just below it was a movable tumor the size of a child's head. She now consented to an operation, and a right-sided intraligamentous ovarian cyst was removed, also the left-sided tubal sac. Her convalescence was undisturbed, and 8 months after operation she was in good condition. The tubal sac was opened and emptied of a pure serous fluid, and situated on its thin walls a tumor the size of a chestnut was found, which the microscope showed to be a papillary carcinoma. This case is an evidence of the long time that a carcinoma may remain in a tube in a benign form. The writer suggests two causes for its slow growth—the pressure of the Meyer's ring upon the tubal sac, and the complete closure of the uterine ostium of the tube with the cessation of the usual discharge. At the time of the operation there were nowhere any signs of metastasis.

The Nature of Hydrosalpinx.—In a review of the clinical aspects of 20 cases of this variety of tubal disease the following ideas are advanced by Clement White¹: In 9 instances the old view that hydrosalpinx is a stage of salpingitis cannot be disproved, for the condition followed extrauterine pregnancy or gonorrhea. In 8 of these the balance of evidence was in favor of the closure of the ostium of a healthy tube by the peritoneum in the way suggested by Cullingsworth. Of the cases, 10 were, in his opinion, a retention-cyst, a tumor *sui generis*, independent of neighboring organs and due to faulty development. In one case the condition seemed to be due to peritonitic closure following an extrauterine gestation. Uncomplicated cases of hydrosalpinx are rare. Some definitely are symptomless until some accident intervenes, such as sudden enlargement of the tumors, or pelvic peritonitis, or growth of another tumor. Pain in the hypogastrium and vagina are by far the most prominent symptoms. There is some pain at the end of menstruation. Dyspareunia and dyschezia are fairly common, as is congestive dysmenorrhea. Menorrhagia and irregularity of menstruation are exceptional. Menstruation is scanty in cases of hydrosalpinx; in fact, in one case, in which there were frequent attacks of pelvic inflammation, is almost the only marked exception to this rule. This single point would make one chary of accepting the view that hydrosalpinx is merely a stage of salpingitis. Irregular and excessive menstruation is one of the most common and constant symptoms of salpingitis. The hydrosalpinx is a retention-cyst, most authors agree. That some cases are little more

¹ Brit. Jour. Obstet., March, 1903.

than a catarrhal salpingitis with an excessive amount of fluid retained, the author is disposed to admit. That some are due to an edematous condition in the final stages of kidney-disease is also probable. That some are due to peritonitic closure of a healthy tube seems also to be true. But many of the cases in which the ostium is such as is commonly described as due to salpingitic closure of the tube are cases of impervious ostia due to faulty development. It is in this class of cases that Bland-Sutton has pointed out that a small pedunculated cyst is often present, whether due to a hydatid of Morgagni or Kobelt's tube he does not know. At least the author would insist that the clinical history in too large a proportion of his cases to be negligible is not the history of a salpingitis, but is often marked by an absence of diagnostic symptoms, and the symptoms which are present are such as are found in cases of maldevelopment, namely, sterility, pain, scanty menses, dysmenorrhea, and dyspareunia.

Leukocytosis in Pelvic Suppuration.—Dützmänn¹ reports 165 cases in which he was enabled to establish the presence of pus in the pelvis before operation. Pus was never found when the blood-count was normal. The writer was even able to infer the cause of the suppuration from the number of leukocytes, a count of 20,000 to 30,000 pointing to streptococcus-infection, while one of from 11,000 to 13,000 was commonly associated with the presence of gonococci or colon bacilli. In peritonitis and septic infection an increase in the leukocytes is a favorable sign, even in the presence of persistent elevation of temperature. If, on the contrary, there is no increase while the temperature is high, a fatal termination may be expected; this is probably due to deficient phagocytosis. Lavvenburg² repeats the observations of Dützmänn, with whose conclusions he agrees, adding some interesting deductions of his own. He finds that in cases of suppuration there is a diminution of the red corpuscles, with a rapid increase in the white. The latter gradually diminish in number after the acute stage, to increase with each exacerbation. The leukocytosis varies directly according to the intensity and extent of the suppurative process. If it is limited, the number of white corpuscles soon sinks to normal; in protracted febrile cases the leukocytosis varies with the different phases of the disease, the red corpuscles behaving in the opposite way. The influence of the patient's constitution upon the leukocytosis is quite striking. In a subject who is exhausted by a long illness or by loss of blood, an increased leukocytosis may persist even after the pus-focus has disappeared. The possibility of mistaking true leukemia for a temporary increase in the white corpuscles must be borne in mind. The increase in eosinophil cells and the presence of large mononuclear cells with neutrophil granules, not seen in normal blood, would settle the diagnosis. Moreover, it must not be forgotten that increased leukocytosis may be present in connection with wasting diseases, fevers, and cancer, and that there are daily variations, especially during digestion.

Pus in the Female Pelvis.—[The occurrence of a purulent collec-

¹ *Zent. f. Gynäk.*, 1903, No. 47.

² *Zent. f. Gynäk.*, 1902, No. 22.

tion in the female pelvis is due in most cases to inflammatory disease of the ovary or tube, and under the caption of pyosalpinx or tuboovarian abscess this has been extensively discussed by gynecologists. Pelvic cellulitis is now recognized as a rare condition, and while the cellular tissue at the base of the broad ligament or anterior to the uterus may become infected and form an abscess, yet the condition pure and simple is seldom observed. Tubal and ovarian abscess, suppurating fibroid and abscess of the uterine wall, hematocele (such as ruptured extrauterine pregnancy which has become infected), suppurating dermoid and ovarian cysts, and, lastly, appendiceal disease, may be causes inducing an abscess in the pelvis.] A. J. Puls¹ remarks that the traumatic influence on diseased tissue is clearly shown in the case of catarrhal appendicitis reported by Rose. A laborer with this condition received a bruise over the abdomen, developed peritonitis, and died, although there was no evidence of perforation. Similarly, exposure to cold, or a local injury, can inflame healthy tissues. Both the vermiform appendix and the sigmoid flexure of the colon, as well as other parts of the intestinal tract, when once glued to the uterine appendages by peritoneal adhesions, may by their contiguity, under the influence of traumatism, give rise to intrapelvic suppurative inflammation. Inflammatory processes in either the appendix or right uterine appendage may affect both, and ascend or descend along the connecting ligament either intraperitoneally or extraperitoneally. The puerperium offers the most favorable conditions for infections. Lacerations of the cervix or perineum, erosions and ulceration of the portio vaginalis, are open doorways for virulent germs. Purulent salpingitis is, as a rule, the sequel of an ascending endometritis. Abscesses of the uterus are formed in the wall of the organ. The pus escapes through the vagina or breaks into the parametrium, or finds an outlet by way of the bladder or rectum. Exudations near the uterus take place in the intercellular tissue within the uterine ligaments. According to its location, we designate an anterior exudate *precervical* when within the vesico-uterine folds. It is called *paravesical* when in the space of Retzius. The *lateral parametrial* exudates are defined according to their position at the base of the broad ligament or higher up between the lamella toward the pelvic brim. Posteriorly the exudate fills the culdesac of Douglas between the sacrouterine ligaments and descends into the recto-vaginal septum. Intercellular accumulations of pus seek first an outlet into an adjacent viscus; next they follow along the sheaths of the nerves and bloodvessels which leave the pelvis. Parametrial abscesses rarely rupture into the free peritoneal cavity. A precervical abscess burrows into the bladder. Paravesical abscesses point in the inguinal regions. Lateral abscesses situated in the broad ligament fill the iliac fossa and then point at the anterior abdominal wall, near Poupart's ligament. In chronic posterior parametritis the ligaments are shortened and contracted, causing acute anteversion of the uterus and frequently deviations of the cervix uteri. Pelvic hematocele, as the result of rupture of a tubal pregnancy, sooner or later becomes infected and undergoes

¹ Am. Gyn., Sept., 1902.

pus-formation unless absorption of the blood occurs. The treatment of pelvic suppuration consists, without exception, in securing effectual drainage. Paravesical abscesses and those in the broad ligament should be incised above Poupart's ligament, analogously to the incision for ligation of the iliac artery (external branch). Tubal and ovarian abscesses should be drained through the vagina. Hysterectomy is justifiable when there must be complete loss of functional activity for the adnexa. Our one aim should be to avoid abdominal drainage and to substitute vaginal drainage.

Inflammation of the Uterine Appendages.—Barbour¹ says that inflammation of the uterine appendages has received attention only during the last 20 years, and was not recognized until the days of abdominal section. Although the part played by germs is well established in the gonorrheal, tuberculous, and acute septic forms of inflammation, their presence has not been proved in all cases. The normal vaginal secretion has been shown to have a distinctly germicidal action. Menge and Krönig maintain that the distinction between physiologic and pathologic vaginal secretions does not hold that all are equally germicidal, but that different germs vary greatly in vitality. Menge tested the efficiency and rapidity of the germicidal action by introducing pyogenic organisms into the vagina in 80 cases, and found that the vagina cleansed itself from these in periods varying from 2½ hours to 3 days. Barbour gives as the 4 symptoms of inflammation of the appendages: Dysmenorrhea, menorrhagia, pelvic pain more or less continuous, and sterility. Sterility and dysmenorrhea with scanty menstruation indicate inflammation of the uterosacral ligament; but profuse bleeding means that most probably the appendages are involved. He distinguishes between dysmenorrhea which is periodic and the continuous pelvic pain due to active congestion of diseased structures. Sterility naturally results from adhesions of the ovary and the fimbria, and from destruction of the ciliated epithelium of the tube. The normal tube cannot be felt in ordinary bimanual examination, and if the ovary and tube are distinctly palpable it means they are enlarged by chronic inflammation. Nonoperative treatment consists of antiseptic douches, tonic aperients, and other internal remedies. Rest is of first importance. Tampons favor rest by supporting the ovaries; glycerin-tampons induce removal of serum from the inflamed tissues and ichthyol causes absorption. The minor operation of cureting is of value in those cases in which the inflammation of the appendages is secondary to that of the endometrium and is relieved when the diseased endometrium is removed by the curet. Dilated tubes which may rupture call for immediate operation and removal. A second indication for removal is profuse menstruation which is pulling down the patient's strength and will not yield to ergot or to cureting.

Operative Treatment of Chronic Parametritis.—Von Ott² finds that pelvic massage is beneficial only in certain cases of chronic parametritis. When there is abundance of cicatricial tissue, such treatment is useless even when continued for months and years. But the patient

¹ Scottish M. and S. Jour., Sept., 1902.

² Zent. f. Gynäk., No. 32, 1902.

needs active treatment, as subacute attacks come on frequently in these cases and greatly impair the patient's health. The scar-tissue compresses the bloodvessels and lymphatic vessels and nerves and drags on the pelvic and abdominal viscera. Sterility is, of course, very frequent. To leave a case of this kind to chance is wrong, and Von Ott finds that there are means of relief. His practice is to divide the cicatricial bands freely; then each raw surface is closed by suture as in pylorostomy so that its short axis is made long. There is no rule for operating; much depends on the position of the scar-tissue, but the principle remains the same, namely, division of the band and the insertion of sutures placed so as to counteract the contraction of adjacent parts. The division of scar-tissue in the broad ligament is specially difficult and dangerous, as not only bloodvessels but also the ureter may be wounded. Hence a catheter should be passed into the ureter. Von Ott finds that, as a rule, the wounds made by dividing the scar-tissue heal by first intention. He has operated on numerous cases for over 3 years with good results.

Conservative Surgery on the Adnexa.—Realizing the many disadvantages that most women labor under after having undergone the recognized mutilating operations upon the genital organs, J. Kiriak¹ proposes a conservative operation that is believed to be entirely original. The operation not only frees the diseased organs from the unhealthy parts, but preserves either the ovary or tube in its totality. The ovary is freed from its adhesions and brought out of the wound. It is then divided from end to end, as in treating a kidney. The two cut surfaces are then carefully examined. All cysts and diseased portions are removed. This operation is called by the author "scapsy," from the Greek "scapto," to sculpture or to hollow out. If the ovary alone is operated upon, it is "ooforoscapy"; if the tube is in question, it is called "salpingooforoscapy," or, more briefly, "parartimatoscapsy." After having removed the diseased parts with a curved bistoury or a pair of scissors, the two fragments are brought together, that is to say, the organ is reconstructed. If there has been much tissue removed, two sets of sutures are necessary to hold the parts together: a deep, retention-layer, and a superficial layer. In the case of an enormous destruction of either organ by abscess or cystic formation, the best procedure is to remove the whole organ, as there is nothing remaining to be preserved. This method of operating has given excellent success in 6 cases.

ABDOMINAL SECTION.

The Suprasymphyseal Incision of Pfannenstiel.—[Various methods of opening the abdominal cavity have been exploited within the past few years, having the common object of avoiding in part or wholly the danger of hernia through the abdominal wall, which follows any operation in this field frequently enough.] O. Beuttner² offers the following notes on his experience with Pfannenstiel's suprasymphyseal incision through the fascia. Disinfection of the skin in which the hair about the genital

¹ *Gaz. de Gyn.*, Jan. 15, 1903.

² *Z'blatt. f. Gynäk.*, 1902, No. 30.

organs grows must, of course, be very painstaking. He has found an admirable addition to the usual method of cleansing the skin to consist in several liberal applications of tincture of iodine. The fact that the incision passes through the skin in this very region is one of the difficulties of this operation, but may be surmounted. The skin-incision itself he has planned, like Pfannenstiel, through the transverse furrow, which is usually present in this situation, especially in women, just above the mons veneris. He then differs from Pfannenstiel in that, instead of loosening the skin and subcutaneous tissue from the fascia itself, he carries his incision directly through all tissues until he reaches the fascia. The object of this slight though important modification is to avoid so far as possible the creation of a "dead space" by an undue loosening of the superficial from the deep structures. The other steps are the same as those of the author of the original operation. He shuts the peritoneal cavity in such a manner that a continuous silk suture of the peritoneum begins at the upper end and ends near the symphysis. He also uses silk in replacing the recti muscles and in suturing the fascia, and again for the skin. He aims to secure as much pressure as possible by the bandage over the region of the wound, so that no leakage from bloodvessels shall occur. Heil¹ warmly recommends Küstner's suprasymphyseal crucial incision (transverse skin incision, vertical muscle, and peritoneal incision) in cases of ventrofixation. He says it offers the best cosmetic effect; it makes the wearing of an abdominal bandage unnecessary; it diminishes the danger of hernia. It can also be used with good results in cases of removal of tubes and ovaries. He avoids the formation of post-operative hematomas by the use of sandbags for from 24 to 36 hours after the operation. He reports his results in 12 cases of ventrofixation, which were perfectly satisfactory. In none of them had he to contend with the complication of hematoma formation.

Mortality in Pelvic Operations.—A series of 100 consecutive abdominal operations for pus in the pelvis with 2 deaths is discussed by Hunter Robb.² From a consideration of the bacteriologic and operative questions he believes that the mortality following operations for disease of tubes or ovaries can be kept under 5 %. The virulence of the specific organisms present, the individual resistance of the patient, the time and manner of carrying out the operative technic, largely influence the death-rate. *Streptococcus pyogenes* is usually the most virulent germ. As the organisms are generally dead, abdominal drainage is seldom called for, and is necessary only when it is impossible to remove the suppurative structures or when bowel-perforation is feared from the separation of adhesions. The pus and its products may be satisfactorily removed by irrigating the pelvic cavity with salt solution. Leaving from 300 to 500 cc. in the abdominal cavity dilutes and promotes the rapid absorption of inflammatory products. This and elevating the foot of the bed for 24 hours tends to prevent the intestines and omentum from coming in contact with the immediate field of operation and diminishes the liability to adhesions. Should symptoms of infection follow the operation,

¹ Münch. med. Woch., Nov. 11, 1902.

² Jour. Am. Med. Assoc., Jan. 17, 1903.

there is usually sufficient time to open the abdomen and wash out all infectious material. The author thinks that operations for pus in the tubes and ovaries from the standpoint of the pus *per se* are not surrounded by any more danger, as a rule, than those in which a purulent focus is not present.

The Trendelenburg Position.—M. Jayle¹ has shown that if there is anything new under the sun that novelty is not the Trendelenburg position. Elevation of the pelvis was practised by ancient surgeons in operations for hernia. Roger, of Parma, and Salerno, who seems to have lived about the beginning of the thirteenth century, in directing how to prepare a man for herniotomy, wrote: "First, let the patient be placed on a bench with the head and shoulders downward, so that all the intestines may sink away toward the thorax. The hips and legs must be kept elevated." Roger clearly understood the mechanical advantages of this position. It is the falling away of the viscera from the pelvis that makes the elevation of the hips so convenient an aid in pelvic surgery. Roland, of Parma, and Brunns in the fourteenth century both give the directions detailed by Roger. But in 1749 an anonymous French author showed that Roger, Roland, and Brunns had copied Albucasis very freely without acknowledgment, and we now know that the Spanish-Moorish writers on medicine largely borrowed from classic authors whose works are lost. Hence, elevation of the pelvis probably originated in the practice of Greek and Roman surgeons. Guy de Chauliac, in the fourteenth century, admitted that elevation of the pelvis was practised in Moorish Spain. Roland furnished his readers with an instructive drawing of a herniotomy, reproduced by Jayle; the patient's head is very low indeed, but Jayle also adds to his instructive article a woodcut of radical cure of hernia from the work of Scultetus. In this instance the patient's head and shoulders are depressed about as much and no more than when modern operators open the abdomen to remove a pelvic tumor. Ambroise Paré, in his directions for taxis in a case of scrotal hernia, directs that the patient be placed on a bed or table with his head down and his nates elevated. The history of the reintroduction of this practice of raising the pelvis is probably well known to our readers. Freund in 1880 advocated the raising of the legs of a female patient by two assistants as an aid to exploration of the pelvis for diagnostic purposes. It was in 1885 that Willy Meyer wrote his work on the practice of Trendelenburg, who was accustomed to elevate the pelvis when placing the patient in the lithotomy position. The falling away of the viscera and the effects of the position on the circulation were strongly urged as highly advantageous to the operator. In 1888 Mendes de Leon strongly recommended the Trendelenburg position both for operations on the pelvic organ and for gynecologic exploration. He simplified the preliminary arrangements by fixing a chair in such a manner that the patient could be kept with the pelvis elevated during the operation without the aid of an expensive table specially constructed for the purpose. At the present day the position is widely adopted. It is rightly associated with the

¹ La Presse Méd., June 25, 1902, No. 51, p. 603.

name of a distinguished contemporary German surgeon, but perhaps, in accordance with general surgical nomenclature, it might more simply be termed "elevation of the pelvis"; indeed, Trendelenburg himself employed the name *Beckenhochlagerung*.

Drainage after Laparotomy.—Olshausen¹ divides operative cases into 4 classes: (1) Cases in which during operation pus or fetid material has proceeded from the operative field. (2) Cases in which partly extirpated tumors with raw surfaces remain behind. (3) Cases with perforated injuries of intestines or bladder. (4) Cases unclean through much soiling of the abdominal cavity with cyst-contents, old blood, etc. Because of the large proportion of cures in these 4 classes, recovering without drainage, he concludes that drainage is superfluous and reprehensible. Sippel, however, does not accept this conclusion. While he would not drain in the last two classes, in the second he might drain with tampons according to Mikulicz, and in the first he advocates ordinary drainage as the more certain method. One cannot say with certainty in any case that the patient will die without drainage or will live if drainage is employed. Much depends upon the sterility or virulence of the pus, also upon the resisting-power of the abdominal surfaces and their power of absorption. But Sippel thinks no convinced advocate of drainage would abandon the feeling of certainty which it gives for the risks of the opposite method in critical cases. Sippel also advocates abdominal irrigation for cleansing purposes, and in his experience has never seen it cause shock or check the heart-action, though he has often seen it have a distinctly favorable influence upon the pulse. M. Hofmeier² disagrees with Olshausen in his condemnation of drainage in any form as superfluous and often positively harmful. He considers drainage in many cases a proper precautionary measure, whose importance it may be difficult to prove positively, but from which, when properly performed, he has never seen any injury. He discusses methods of drainage, apparently in most cases preferring an open tube to a gauze drain, yet adapting methods to the peculiarities and necessities of each case.

The Control of Hemorrhage in the Removal of Pelvic Tumors.—

Herman Pearce³ believes that the best way to control hemorrhage in the removal of pelvic tumors in the female is to search out and control the vessels that are the source of the hemorrhage as early as may be in the operation. When the tumor is parovarian and its growth takes it between the layers of the broad ligaments, in all broad-ligament cysts, in intraligamentous fibroids of large blood-supply and intimate connection with the surrounding tissues, and in extrauterine pregnancy with intraligamentous rupture, it is better to tie off the superficial blood-supply at all points along the pelvic side, and then, instead of tying again on the uterine side, go to the healthy side, including the uterus and healthy adnexa in the occlusion, and do a panhysterectomy from the opposite (healthy) side, coming upon the deep blood-supply of the growth from below and behind. The electrothermic clamp is a valuable instrument.

¹ Zent. f. Gynäk., Feb. 7, 1903.

² Zent. f. Gynäk., Feb. 21, 1903.

³ Ann. of Gyn. and Ped., Jan., 1903.

Ligation is the best method for controlling bleeding vessels. Suitably prepared chromicized catgut is preferred to silk or any of the other ligature materials.

A. J. Downes¹ states that his experience with his method of **electrothermic hemostasis** warrants the conclusion that there is less pain after abdominal operation with electrothermic hemostasis than with the use of ligatures. The operations are quite bloodless. In addition to the hemostasis, there is a sealing of the lymphatics. This is a valuable aid in preventing the recurrence of cancer. Transplantation through the desiccated surfaces is impossible. In appendectomy this method is superior to the other methods in vogue. The accompanying illustration (Fig. 98) shows the instrument applied in the operation of hysterectomy.

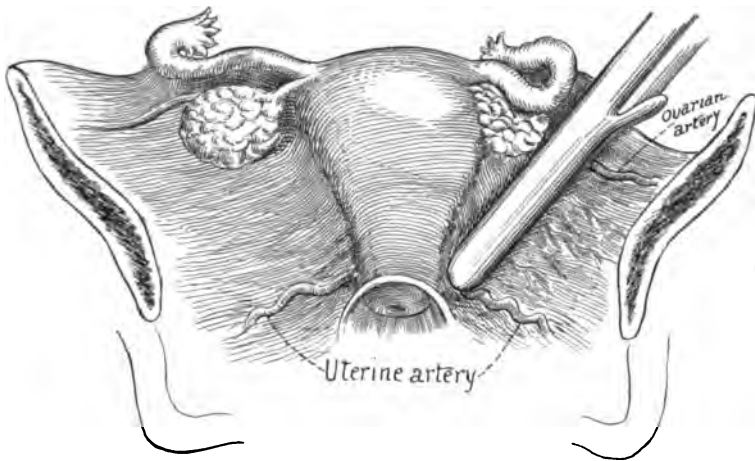


Fig. 98.—Downes's method of electrothermic hemostasis. Uterus with blades of angiotribe in place on broad ligament (Jour. Am. Med. Assoc., July 12, 1902).

The Scope of the Vaginal Incision.—The greatest stimulus to the treatment of pelvic and abdominal diseases by the vaginal route was inspired by the work of Péan and his followers. This line of work was quickly adopted by the Germans, and in due course of time, says A. F. Currier,² it was employed by operators all the world over. By vaginal incision is meant any vaginal cut, whether it be anterior to the vaginal portion of the cervix, circular, or posterior to it. The circular incision has its sphere of usefulness almost exclusively in those cases in which the uterus is to be removed, with or without the appendages, whether for cancer, fibroid tumor, prolapsus, or any other condition. The range of usefulness of the anterior incision, with its modifications, is somewhat more extensive. Currier thinks that it is less useful than the posterior incision because of the space limitation by the pelvic bones, the proximity of the bladder, and the relative narrowness of the vagina compared with the posterior vaginal fornix. The posterior incision with its modifica-

¹ Jour. Am. Med. Assoc., July 12, 1902.

² Ann. of Gyn. and Ped., May, 1903.

tions affords the greatest possible working space, and it is this variety which gives the vaginal route of surgical treatment its greatest sphere of usefulness. Hemorrhage after vaginal section can be most easily checked by pressure, provided there be no large vessels involved, and there is a less severe tax to our mental equilibrium than in the more formidable operation of opening the abdomen. Hernia is less liable to occur, and when it does, it can be cured by a few well-placed stitches. The most frequent indication for the anterior incision in operations upon the uterus is in retroflexion. It may occasionally prove valuable in making a diagnosis of diseased condition of the anterior portion of the pelvis. The following are the indications for the employment of the posterior incision: (1) For diagnosis; (2) in pelvic exudates, whether adhesive bands, plastic deposits, or collections of pus; (3) tumors of the appendages; (4) pedunculated uterine myomas; (5) intraligamentous cysts; (6) displacements of the uterus and appendages; (7) accumulations of fluid in the pelvic or abdominal cavity, not encapsulated or isolated; (8) some exigencies of parturition and of the puerperal state. There are doubtless other indications for the vaginal route. The most of those to which attention has been called have been suggested by his personal experience or observation. This method of operation is of especial advantage in operating upon the uterine appendages, according to J. M. Branham.¹ The author has successfully employed it in (1) pelvic inflammation, (2) neoplasms, (3) myomas, (4) extrauterine pregnancy. Here it is of especial advantage. If the case is of several days' standing and an elevated temperature would indicate that there existed an infection, vaginal drainage is the natural method; it is by far the more effective and the safer. Extensive inflammation associated with pus-formation rapidly walls off the general peritoneum; this wall should not be broken through and cannot be interfered with without danger of general peritonitis. Opening through the vagina is associated with a minimum amount of shock and hemorrhage, and is thus indicated in grave cases associated with severe toxic symptoms. While freer dissection in the lateral plane (pelvic) for infiltration complicating uterine cancer can be made through the abdominal route, yet the less thorough dissection of the surrounding vaginal wall and the greater danger of transplantation (operative), with increased mortality due to shock and infection by it, render vaginal hysterectomy the safer operation and the one to be advised in most cases.

COMPLICATIONS DURING AND AFTER ABDOMINAL OR VAGINAL SECTION.

Peritoneal Adhesions.—B. Jessett² thinks it is probable that in a large majority of cases of celiotomy subsequent adhesions are formed and pain is sure to follow; the surgeon should bear this in mind and pay especial attention to the toilet of the peritoneum. He should see that no blood-clot is left in the Douglas sac, or between the intestines; and,

¹ Am. Jour. Obstet., Nov., 1902.

² Brit. Med. Jour., Nov., 1902.

above all, he should be careful to draw down the great omentum over the intestines, as less trouble will arise from adhesions to this than to the intestines. In case of ordinary ovariectomy the stump left should be carefully stitched over and buried so as to be completely covered with peritoneum; and for this work ordinary sterilized catgut should be used, not silk. These adhesions may not only cause pain, but may become a serious peril to the patient, as in the various forms of intestinal obstruction resulting from adhesions. Another danger is the kinking or adhesions of the ureters and their possible inclusion in ligatures. This can be prevented by not ligating the uterine arteries until the anterior and posterior flaps of peritoneum have been reflected from the uterus, when the vessels are readily felt running up the side of the cervix and can be ligated without including other tissues. The appendix sometimes becomes involved in these adhesions following removal of the appendages. Another cause of pain after hysterectomy may be that a remaining ovary has become adherent. To prevent these troublesome adhesions, Jessett now uses a specially prepared catgut for all suturing of peritoneum and ligating of vessels; he carefully buries all stumps of tumors and sutures any torn or cut portions of the peritoneum.

Suppurating Abdominal Incision.—Darnall¹ dwells on the principal causes of suppuration of the wound made in abdominal section. Among the most frequent are bruising of the fat by the hands or retractors, small collections of blood, due to carelessness in securing bleeding points, which form foci for infection; deep sutures conveying infection through the skin, and buried sutures of nonabsorbable material. Catgut may be septic, and chromicized catgut often contains free chromic acid which irritates the tissues. Abscess develops and bursts; if discovered early, the removal of one or two sutures and the evacuation of the pus may restrict the destructive process. But the suppuration often travels the whole length of the incision, which must be reopened, converting the abscess into a widely open area. To destroy the pus and keep the field clean hydrogen peroxid may be used once or twice daily, followed by a weak perchlorid of mercury solution, or solutions of protargol, argyrol, or formalin. When the surface has become healthy, it is not safe to apply sutures, and healing by granulation is tedious, and causes a large irregular scar. Darnall, therefore, applies the curet to the incision, under an anesthetic, to freshen up the granulations. He next places a narrow strip of iodoform gauze or a few strands of silkworm-gut for drainage. A strip of adhesive zinc-oxid plaster, about 2½ inches in width, is now laid on each side of the incision, ¾ inch from its margin, and interrupted sutures are passed between the inner edges of the plaster across the incision without penetrating the skin. An assistant brings the edges of the incision together over the drain by using pressure on each side of the wound. The sutures are next tied firmly across the incision. The two sides of the incision being closely approximated by this means, union takes place promptly, and when the drain is removed only a straight linear cicatrix remains.

¹ Am. Gyn., March, 1903.

Parotiditis following Abdominal Section.—Morley¹ has prepared an instructive table of classes of this formidable complication, including one in his own experience. Seven cases were in males and 44 in females; 26 were ovariectomies, and the remaining 25 were operations on the pelvic viscera (oophorectomy 2, hysterectomy 3, "uterine tumor removed" 3, operation for suppurative peritonitis 1, herniotomy 1, operation for intestinal obstruction 1, gastrectomy 2, operation for gastric ulcer 1, removal of vermiform appendix 2, operation for penetrating wound of abdomen 1, operation for bullet wound of stomach 1, "abdominal section" 5—2 of these were most probably ovariectomies. Some of the cases entered as "ovariectomies" were probably removal of the ovaries with diseased tubes; thus, the author's new case, in which a pair of pus-tubes were removed with the ovaries and vermiform appendix, is placed under this head. There is no fixed period of incubation; 9 occurred on the third day, 5 on the fourth, 5 on the fifth, 8 on the sixth, and 5 on the seventh; thus the complication appeared between the third and seventh days in 32 out of the 51 cases. The remaining 19 cases ranged from the eighth to the twelfth days, except 3, in which the parotid began to swell on the second day. In 16 cases both glands were attacked; in 15 the right and in 13 the left parotid glands were specified as the seat of inflammation; in 7 the side was not specified. Pus was present in 20 and absent in 31 cases. The bacteriology of parotiditis following abdominal section is, strange to say, very defective, as in a large number of the reports the complication is merely mentioned as an incident in convalescence. *Staphylococcus pyogenes aureus* was isolated in Bumm's and also in the author's cases; 38 cases recovered and 13 died; pus was detected in 9 out of the 13 fatal cases. Morley maintains that these results justify Stephen Paget's opinion that the deaths were not due to the suppuration of the gland, but the gland suppurated because the patients were going to die.

DISEASES OF THE OVARIES.

Adnexopexy.—H. D. Beyea² states that by adnexopexy is understood a surgical elevation of the prolapsed ovary and tube. It is used in simple prolapse of the ovary and tube into the rectouterine or Douglas's pouches. It is also applicable to those chronic inflammatory conditions of the tube and ovary in which there is some degree of prolapse, and in which the pathologic changes have not become so extensive as to require ablation of the structures. That a prolapsed ovary may be symptomless, or, on the other hand, may cause grave nervous disturbances, is generally admitted. If permanently replaced in its normal position, the local congestion and inflammation which seem to be the cause of these nervous troubles are relieved and there is a return to normal size and function. The method of operation is as follows: The abdomen is incised and any adhesions of the prolapsed ovary and tube are carefully

¹ Am. Gyn., Dec., 1902.

² Amer. Med., vol. iii, No. 26, p. 1087, June 28, 1902.

separated. The fimbriated extremity of the tube is caught and drawn forward, exposing the suspensory ligament. A fine silk suture is placed through a small portion of the double end of the suspensory ligament, and then through the ligament near its pelvic attachment. Two or three sutures, or a sufficient number to close the fold made in the ligament, are placed below this one. The sutures are then tied. Care is taken not to include the ovarian artery or constrict it in the suturing. The position of the first suture determines the degree of elevation of the adnexa. It may be necessary to include in the suture the tubo-ovarian ligament.

Successful Transplantation of Ovaries.—Walther Schultz¹ gives his results and a full résumé of previous work. So far this has not touched the wider anatomic, physiologic, and psychologic questions (whether castrated males with implanted ovaries develop the female form of pelvis, show preference for males, etc.), but has related only to the possibility of success in transplanting, and the changes occurring in the transplanted tissues. The possibility of transplantation is now demonstrated beyond question. Both in young and in almost grown animals the ovaries become attached in their new position, whether this be the peritoneal cavity of the same female, of another female, or of a male, or of the same bred or of a female of a different breed. Schultz's main conclusions are: On other females of the same breed transplanted ovaries of mammals can give off eggs and form corpora lutea; on males of the same breed such ovaries can develop ripe eggs up to 42 days, and show such after 117 days; on females of other breeds such ovaries exhibit, in the first 8 days, no difference from ovaries transplanted on females of the same breed; the mode of healing and development corresponds in the animals investigated to the phenomena described by Ribbert; and, in ovaries transplanted on to males, eggs can be demonstrated in the root, and tube-formed processes crowding from the germinal epithelium downward into the tunica albuginea. At the same time, according to Ribbert and Schultz, changes takes place which at least stimulate the embryonic condition—mitosis appears in the cells of the germinal epithelium, and from it root-like or tube-like processes grow downward into the tunica albuginea. In these processes Schultz was able to demonstrate eggs. The transplanted ovarian tissue appears not to be injuriously influenced either by the blood of the male or by anything (secretion or other influence) from the testicles; at least no such influence was noted in the somewhat short time covered by the experiments. Transplantation does not operate to produce any unusually rapid growth in ovarian tissue, as might possibly be expected, considering that it is tissue freed from its normal connections. The author suggests that it is imperative that this subject be followed up by such experiments as implantation of ovaries in a female of another breed whose ovaries have been previously removed, and that breeding experiments be then carried out with the male of that breed. And we might mention many other experiments which crowd on us, but they are too obvious.

Tarry Hematoma of the Ovary.—Dorland² calls attention to a

¹ *Monats. f. Geb. u. Gyn.*, Dec., 1902. ² *Am. Jour. Surg. and Gynec.*, Aug., 1903.

condition not generally mentioned in the text-books, and which he designates by the title given above. By this term he means the development in the ovarian tissue of a large cystic formation which may reach the size of a fetal head and contain half a pint or more of a dark grumous or tarry blood precisely similar in nature to the retained menstrual blood of hematokolpos and hematometra. The pathology of tarry hematoma is as follows: The ovarian stroma is largely if not altogether destroyed, and only the capsule, thinned out and distended, remains. Dense adhesions are formed to the broad ligament and surrounding viscera. The cyst-wall is dark-blue or almost black in color, of an appearance quite distinct from the angry reddish-blue color of a cyst that has been subjected to torsion of the pedicle. It is probable that the condition develops in an ovary the capsule of which has been the seat of a slow, inflammatory change which has so thickened it that rupture of the mature graafian follicles is prevented. The retained blood from these follicles has not been absorbed before other follicles contribute their contents, and the hyperemia and venous stasis of the organ act as still further contributing causes. Gradually the septa between the unruptured follicles become absorbed and the ovary becomes the seat of a slowly but progressively increasing hematoma. The bloody contents undergo a slow process of inspissation until the tarry fluid results. Dorland reports an interesting case of this condition.

Pedicle-torsion in Ovary Neoplasms.—An editorial in "American Medicine"¹ remarks that two strong arguments in favor of early operation in newgrowth of the ovary are: First, the impossibility of any relief being afforded by medicinal treatment and the certainty of progressive increase in size and symptoms; second, the danger of the pedicle becoming twisted and producing symptoms which demand immediate operation. Recently the writer has seen 2 cases in which this accident had occurred, producing marked symptoms and requiring immediate surgical intervention. In one of these an ovarian fibroid was present and evidences of inflammation and ascites were found. In the other case a glandular cyst about the size of a cocoanut showed necrotic areas, due to the axial rotation of the pedicle. Rokitansky found torsion of the pedicle in 12 % of all cases of ovarian tumors, and in 6 % of the cases it was the cause of death. Various causes have been suggested for this axial rotation. It has been attributed to alternative distention and evacuation of the bladder. Küstner ascribed it to peristalsis and the changes from the distention of the rectum; Cario, to sudden belly-pressure; and Mickinwitz, to contraction of the transversalis muscle. Any sudden jar or motion of the body, such as jumping, dancing, or falling, may be a factor. Torsion is more apt to occur in cysts of small and medium size than in large tumors. The direction of rotation is usually toward the median line, although it may take place in the reverse direction. A spheric, nonadherent cyst with a long pedicle is peculiarly liable to this axial rotation, which, checking the venous outflow from the tumor, causes hemorrhage into the interior, sometimes severe enough to

¹ July 19, 1902.

result in the death of the patient. If the patient survives this accident, the cyst assumes more the nature of a foreign body, exciting a violent inflammation in all the contiguous parts of the peritoneum and becoming attached to it by vascular adhesions, which more or less replace the normal blood-supply. A moderate twisting of the pedicle of 90° produces no symptoms. It is only when the torsion is sufficient to influence circulation, or above 180° , that symptoms are produced. This accident is especially liable to occur when an ovarian cyst complicates pregnancy or the puerperium. According to Kelly, a cause of rotation of cysts is that large multilocular cysts exhibit a notable tendency to the formation of one large cyst-cavity, with a number of subsidiary ones, and the tumor will invariably turn until the convex surface of the large cyst comes to lie in relation to the concavity of the distended anterior abdominal wall, and that the alternate relaxation and contraction of the anterior abdominal walls act most decidedly upon that part of the tumor which is nearest the median line. The result of this change of position depends upon the extent of the torsion and the rapidity with which it has occurred. The effect is first felt by the veins, which are more compressible than the arteries, and the venous blood-current becomes obstructed while the arteries remain open. The tumor may increase rapidly in size, and in acute cases the patient complains of severe pain in the abdomen associated with meteorism, marked tenderness on pressure, acceleration of the pulse, and sometimes singultus, vomiting, and fever. According to Montgomery, in the more chronic condition, when the blood-supply is not completely obstructed, the pain and unfavorable symptoms are more gradual, though many patients are bedridden and show a distinct loss of strength produced by the absorption of the altered constituents of the tumor, causing a condition resembling cachexia. The treatment for ovarian tumors in general is ovariectomy, a simple operation in uncomplicated cases. As it is impossible to decide with certainty whether the given neoplasm is not malignant, or to insure against the occurrence of such accidents as pedicle-torsion, cyst-rupture, or infection, extirpation is positively indicated.

Myoma of the Ovary.—[True myoma of the ovary is perhaps the most rare of ovarian diseases, and but few cases have been reported.] J. M. Baldy¹ finds that the literature contains but 8 such cases, the case of the author making the ninth. Mrs. D. T., colored, aged 36 years, married 15 years, had had one pregnancy which terminated in a miscarriage. Menstruation for the past dozen years had lasted 5 to 7 days, and had been quite free. Three years ago her doctor had told her that she had a tumor, but it had given her no trouble except for an occasional hemorrhage, which would last perhaps as long as 10 days. These had yielded to very simple treatment. Examination disclosed a multilocular cyst of the uterus, hard and with the ordinary characteristics of a fibroid. The history was that of an ordinary fibroid and operation was performed for that condition. The specimen after removal consisted of a uterus enlarged by a multiple fibromyoma to the size of a small

¹ Am. Gyn., Nov., 1902.

cocoanut. The right ovary was nowhere to be found. The left ovary was cystic. Where the fimbriated end of the fallopian tube disappeared in the capsule at the top of the tumor, beneath the capsule, an exceedingly small piece of tissue was found which on section proved to be ovarian. The tumors in the uterus were ordinary fibromas. What is the significance of these facts? The first and all-important question to decide is, Is or is not this a subperitoneal nodule of a fibroid uterus? There are but two lines on which such a nodule could develop at this point: First, subperitoneal, in which case it would be subperitoneal at all points of the tumor; second, a pedunculated nodule, in which case it would come off the uterus and hang free in the pelvis, but would in no way attain the relations to the broad ligament which are held by the ovary or by this tumor on its upper surface. In either case how could we account for the disappearance of the ovarian ligament and the ovary? A broad-ligament tumor would have relations essentially different from those which pertain to this tumor. On the other hand, assuming that this tumor began to develop in the ovarian ligament or in the capsule of the ovary, every possible difficulty disappears and all its relations without exception are accounted for.

ORTHOPEDIC SURGERY.

BY VIRGIL P. GIBNEY, M.D., AND J. HILTON WATERMAN, M.D.,
OF NEW YORK.

THE ARM.

Treatment of Fractures and Injuries to the Elbow-joint.—A. J. Gillette and J. B. Brimhall¹ read a paper on this subject before the Minnesota State Medical Society, in which only fractures and dislocations of the joint are discussed, but other injuries which give no exact lesion are admitted. Thirty cases which had been under personal observation were reported. A number of x-ray photographs were shown, one showing the condition of an arm dressed at right angles for a fracture of the lower end of the humerus; also photographs showing the arm flexed to the limit and extended to the limit. The authors conclude that the dressing which is advised is easy of application and in most instances comfortable for the patient. Also, that a fracture of the external or internal condyle is the most frequent fracture, and that the muscles arising from these condyles have a tendency to draw the fractured portion toward the median line and in front of the elbow-joint, thus blocking flexion, and with a straight splint they are easily held in position. Again, if there is a great deal of callus there is no danger of the olecranon fossa becoming filled with it and thus blocking extension, and the olecranon process furnishes an admirable splint to keep in place fragments when the condyles are fractured. An anesthetic should always be used in reducing these fractures, as they result from such slight causes in children that they might easily be overlooked; besides, under an anesthetic it is much easier to reduce the deformity. Finally, the position which these authors advise gives the very best results, but the fracture must be perfectly reduced, and two imperfect results reported in this series are due to imperfect reduction.

Suture of the Brachial Plexus for Birth Injury.—Kennedy² has operated upon 3 cases. He describes the operation in detail. He advocates extending the course of the brachial plexus, tearing them in the region where the injury is probable, and breaking up old adhesions.

Fracture in or Near the Joints.—A. J. Gillette,³ before the Minnesota Valley Medical Association, read a paper on this subject. He emphasizes the importance of proper reduction of fractures at or near the joint. If a fracture of the long bones should not be properly set, we may get a

¹ St. Paul Med. Jour., 1902.

² Am. Jour. Orthopedic Surg., Aug., 1903.

³ St. Paul Med. Jour., March, 1903.

poor anatomic result and a good functional result, but the functional result of a fracture at or near the joint depends almost entirely upon the anatomic results. Regarding massage, there is no doubt that in cases where it is employed the patient can use the limb sooner than if

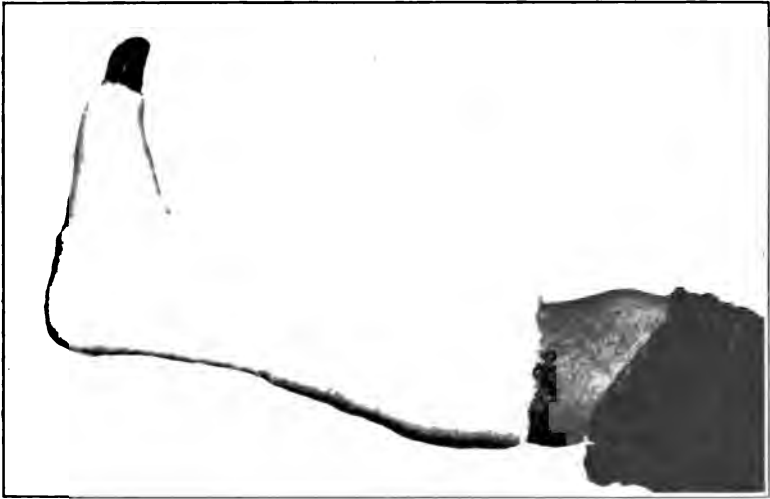


Fig. 99.—A plaster cast properly applied with foot at a right angle and slightly adducted, for all fractures at or near the ankle-joint (Gillette, in St. Paul Med. Jour., March, 1903).

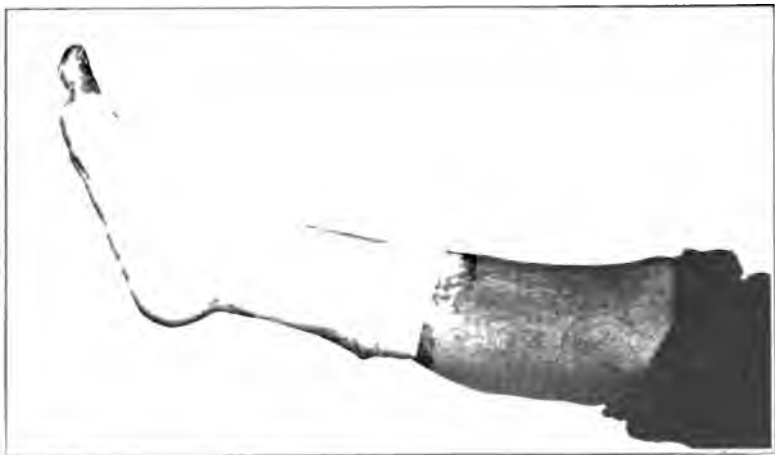


Fig. 100.—A frequent and bad position of the foot in a fracture at or near the ankle-joint, with a badly applied plaster cast (Gillette, in St. Paul Med. Jour., March, 1903).

it remains immobilized for the usual 6 weeks. To obtain union this is not necessary, and there is great danger in removing the dressings to perform massage. The term massage in this connection does not mean passive motion. Passive motion before union has taken place is very

dangerous, not only because of the danger of displacement, but because of the irritation and the consequent inflammation, causing exuberant callus. Where simple, comminutive, or compound, the plaster-of-paris cast, well padded with cotton and roller-bandaged, is the most serviceable and easily applied, and, further, in a joint fracture a cast with window-holes makes the cleanest dressing. A union of an intracapsular fracture of the hip is not due to the structure of the bone in the neck of the femur or the peculiar physiologic changes in the agent. This is proved by the many cases of union where proper mechanical and surgical means have been applied to hold the fragments in apposition. The nonunion of these intracapsular fragments is due nearly always to lack of reduction, thorough immobilization of leg and continued apposition of the fractured ends. For ununited fracture of the neck of the femur, the operation first performed by E. Boeckmann is advised. The operation consists, first, in making a horseshoe incision, beginning it an inch below and an inch posterior to the anterior superior spine of the ilium, carrying it



Fig. 101.—A properly applied plaster cast for a fracture at or near the wrist-joint, allowing the thumb and fingers free movement (Gillette, in *St. Paul Med Jour.*, March, 1903).

down 2 inches below the trochanter major, and bringing it up to the buttock, to the center of the gluteus maximus muscle; the skin, superficial and deeper fascia are dissected en masse. Two illustrations are shown, one in plaster cast properly applied, with the foot at right angles and slightly adducted for all fractures at or near the ankle-joint (Fig. 99); the other showing a frequent and bad position of the foot in a fracture at or near the ankle-joint, with badly applied plaster cast (Fig. 100). In fracture of the wrist the author advises a plaster-of-paris cast extending from the elbow to the base of the fingers, leaving the fingers and thumb exposed (Fig. 101). In this way the fingers can be kept from becoming stiffened by the adhesions of the tendons passing in the locality of the fracture.

THE SPINE.

Case of Double Pott's Disease.—R. T. Taylor¹ describes a case of a boy aged 7 years. He had a very unusual case of double Pott's disease,

¹ *Amer. Med.*, Sept. 13, 1902.

with distinct isolated foci of tuberculous disease involving the fifth, sixth, and seventh dorsal vertebrae above, and the first, second, and third lumbar vertebrae below. The x-ray picture of this case is especially interesting as showing clearly intense shadows and two foci of disease. At the dorsal focus the lessened space between the ribs and focus of tuberculous disease appearing through the heart shadow is noted.

Round Shoulders and Faulty Attitude; a Method of Observation and Record with Conclusions as to Treatment.—R. W. Lovett¹ read a paper on this subject before the American Orthopedic Association. From his study of the subject he states that our knowledge of faulty attitude has been incomplete because the spine alone has been considered, rather than the relation of the legs and pelvis to the spine, and the relation of the whole body to the perpendicular, and the uniform method of measurement and record is desirable. The method described gives us a side elevation of the whole attitude, and the relation of legs, thighs, pelvis, spine, and head to each other and to the perpendicular, but the seat of faulty attitude is not as yet formulated.

Genesis and Treatment of Spondylitic Paralysis.—Tillmans² describes two methods: (1) An opening into the vertebral paths from the side, and of permanent drainage. The best method of performing this is caustro-transversectomy of Ménard. (2) Laminectomy, especially in cases of caries of the vertebral arch and as a leg operation in the older, nearly cured cases in which granulations, callus, sequels, and bone edges have been causative agents. [Our own results in operative procedures on the vertebrae for compression paralysis fail to convince us that such procedures relieve the cord itself, irrespective of the causes found for compression. Cases operated on early are inconclusive because of the well-known tolerance of the spinal cord.]

Round-shoulder Deformity in Childhood, with Especial Reference to the Proper Adjustment of Clothing in Preventing and Treating Such Conditions.—J. E. Goldthwaite,³ as the result of the examination of a large number of children, both in the hospital clinics and in private practice, is of the opinion that the chief factor in the etiology of this condition is the improper adjustment of the clothing, especially as the condition develops as the simple clothing of infancy is discarded and the heavier and somewhat complicated costume of the child is assumed. This opinion is strengthened by the fact that the difficulty so often corrects itself at the time of puberty, when the arrangement of the costume again changes, the shoulders at this time being depended upon less for support. As regards underwaists, practically all are so made that the weight is applied at the outer or movable portion of the shoulder, the position which is least capable of bearing weight. The waist which has been the most satisfactory is made of firm cotton material and is cut high in the neck, with a rather narrow back and with a loose, easy front. Two straps made of double thicknesses of the

¹ *Trans. Am. Orthopedic Assoc.*, 1902.

² *Arch. f. Orthop.*, Bd. i, Heft 2; *Am. Jour. Orthopedic Surg.*, Aug., 1903.

³ *Am. Jour. Orthopedic Surg.*, Aug., 1903.

same cloth are sewed to the waist, and upon these the chief drag comes. The straps start well at the side, in front, cross the shoulder near the base of the neck, and cross back to the opposite hip. In this way the chest is left free, and whatever drag there may be tends to draw the shoulder backward rather than forward.

Spondylitis with Unusual Lateral Deviation.—A. H. Freiberg¹ reports a case showing this condition. In conclusion he describes a modification of old methods in the application of plaster-jackets in Pott's disease, and especially in cases presenting much lateral deviation. It is in effect a combination of three well-known existing methods; extension from the head, the prone position in the hammock, and the oblique position of Keibel. It would be found advantageous in cases with considerable deviation to allow the patient to remain in the frame for some minutes before beginning the application of the plaster. By this means considerable relaxation may be secured, so that unless very unusual, lateral deviation may be overcome in great measure in one sitting. [We can bear testimony to the lateral and oblique positions in securing marked improvement in the curve. Much manual force may be employed at the same time with slight pain or discomfort.]

Noisy Shoulder.—R. H. Sayre,² before the American Medical Association, presented a patient seen 2 months before, giving a history of slight curvature of the spine, accompanied by grating of the muscles over the scapula on moving the shoulder up and down. There was also pain over the deltoid on the same side. The impression was given that the scapula was sliding over some substance. The case was presented for diagnosis and suggestions for treatment. V. P. Gibney stated that he had had a similar case under observation in a young woman, aged 20. R. Whitman had seen several such cases, and he thought it was caused by a snapping tendon between or possibly by a bursa beneath the scapula. Homer Gibney stated that in giving exercises to patients he had noticed these crackling sounds in many cases, and especially in one exercise for lateral curvature.

THE HIP.

Progress of the Treatment of Congenital Hip-dislocation.—H. I. Taylor³ concludes from his observation of the results of treatment both in this country and abroad that the femoral head and neck and the acetabulum are usually more or less malformed or imperfect, rendering anatomic replacement difficult or impossible in the majority of cases. The main features of the Lorenz method are thorough tearing of the adductors, preliminary to reduction, stretching of the hamstrings and contracted tissues in front of the hips after reduction; fixation in hyperabduction and flexion, and retention for from 9 to 12 months in plaster-of-paris followed by rather careful after-treatment of some months. A point to be borne in mind is that the use of very great or prolonged force is liable

¹ Trans. Amer. Ortho. Assoc., 1902.

² N. Y. Med. Jour., Jan. 3, 1903.

³ Post-Graduate, Oct., 1903.

to be followed by serious consequences, and is not good practice. The various open operations also have their place in difficult operations and are still being perfected to meet the indications.

Congenital Dislocation of the Hip.—Kirmisson,¹ in his service at the Trousseau Hospital since 1898, in 27 unilateral cases reports that 10 were either impossible or for some other reason other treatment was tried, so that 17 cases were operated by the bloodless method. Five had no shortening and 2 had 1 cm. shortening, and the others from 2 to 4 cm. shortening. Functional results were good in the majority of cases.

Congenital Dislocation of the Hip-joint and Club-foot.—A. Lorenz,² in one of his clinics given in this country in which he demonstrated the operation of congenital dislocation of the hip, referred to this method as the functional weight-bearing one and described in detail the principles of the operation. The first step of the operation is to place the head of the femur in the acetabulum. The possibility of this abduction is limited by the age of the patient. In very young children there will, of course, never be any difficulty in pulling down the head of the bone to its proper position. In older children and in adults it is no longer possible to do this. The age limit for this procedure in cases of bilateral dislocation is said to be the seventh or eighth year. After this age limit it is necessary, before attempting the reduction, to institute a rather lengthy preparatory treatment, consisting in extension and tenotomy. The age limit in cases of unilateral dislocation is about the tenth year. The oldest case in which reduction was performed was in a patient aged 23. The real reduction is done by traction and by bringing pressure to bear down on the trochanter. Lorenz prefers reduction by way of forced abduction, which can be kept up with a wooden pillow beneath the trochanter to act as a fulcrum until the head can be felt to slip over the posterior portion of the acetabulum. Unfortunately, in all these cases the acetabulum is so shallow that the head would immediately slip out if the leg were brought into even an approximately normal position. In order to retain the head in its place, it is necessary to put the leg in a right-angled abduction. In order to still further insure the fixation of the head in the acetabulum it may be expedient to stretch the anterior part of the capsule an inch by free rotary movement of the thigh. After a new position of the leg has been attained, the flexors of the knee-joint become too short, and we consequently find the knee rigidly placed. This shortness of the muscles is also overcome by careful but forced stretching of the leg, bending the knee and extending it until it is possible to have complete extension. In cases of unilateral dislocation appliances which will permit the patient to walk as soon as the pain and uncomfortable feeling of the extreme position have disappeared are advised. In cases of bilateral dislocation voluntary motion is practically impossible. A stockinet bandage is first put on; under this is run a strip of gauze about 5 or 6 inches in width, which is allowed to protrude above and below. By pulling on the ends of this strip and passing it to and fro under the bandage, the

¹ Rev. du Orthop., May, 1903.

² Canad. Pract. and Rev., March, 1903.

skin under the cast can be kept clean. The strip is replaced after each cleansing by a fresh strip. Over the stockinet bandage a very abundant supply of cotton is applied, and over this the plaster-of-paris bandage. The operation was demonstrated on a number of cases. In one the leg was about $1\frac{1}{2}$ inches shorter than in the other, and attempts at abduction were unsuccessful. The head of the femur was felt very distinctly just behind the acetabulum. The next case operated upon was that of a child having a double dislocation. Another case was that of a child operated on 3 years ago for the same purpose, without any result. The operator attributed the failure to the abductor muscles, which were allowed to remain intact. Another case shown at the clinic was that of a bilateral dislocation in a child of 7, in which it was deemed impossible to effect a reduction. The final case operated on was that of a child 11 years old, which is about the age limit in this work. Attention was called in this operation to the danger of tearing the femoral artery, which might mean an exarticulation of the hip-joint. The bloodless modeling method of treating club-foot was next demonstrated. This operation so thoroughly corrects the deformity in the newborn that it is no longer necessary to resort to cutting operations later on. Lorenz stated that in his modeling redressment of the club-foot is equally applicable in older children. The patient on whom this operation was demonstrated was 16 years of age. Not only is it important to overcome resistance of the soft parts, but such resistance must be completely annihilated. The principle is to keep on with the active correction until the elasticity of the soft parts is completely destroyed, so that the foot will no longer rebound to its original position. Great care must be taken in applying the cast after this method, as it is kept on for several months, and it must be renewed after its removal, until the foot is in a perfect valgus position, when it is no longer restrained by a dressing.

Subtrochanteric Osteotomy in Adults, in Adolescence, and in Young Children.—E. H. Bradford,¹ in a paper read at the annual meeting of the American Orthopedic Association, concludes that the operation of subtrochanteric osteotomy for the correction of a deformity following hip disease is one which can be done in adults without fear of nonunion, or even in middle life, and that the danger of relapse is greater when the operation is done in childhood or in rapidly growing years. The danger of nonunion is apparently not an imminent one when the operation is undertaken in middle life. For this reason it would seem to be better surgery, when possible, to defer the operation in young childhood until the period of rapid growth is passed.

Correction of Deformity at the Hip, the Result of Disease; a Study of the Best Methods and Best Positions.—V. P. Gibney,² at the annual meeting of the American Orthopedic Association, discusses this subject from a clinical standpoint. One case reported is at least suggestive of damage done to tissues undergoing repair and the opening up of an old inflammatory process. There are cases innumerable where the same

¹ Am. Jour. Orthopedic Surg., Aug., 1903.

² Am. Jour. Orthopedic Surg., Aug., 1903.

amount of force has been employed and the same correction secured without any untoward symptoms. The most satisfactory results, so far as improving the length of the limb is concerned, have been accomplished by subtrochanteric osteotomy. It is the experience of many who have collected statistics at the Hospital for Ruptured and Crippled to find a certain number of relapses after subtrochanteric osteotomy. It is also the experience of these gentlemen that relapses occur about as frequently after forcible correction through the joint. The cases where relapses have occurred after osteotomies below the trochanter are reported. It has been suggested that if disease does occur after forcible correction, the symptoms are of slight import, and that fixation and a well-fitting plaster-of-paris bandage are sufficient to guard against any serious relapses. A case reported in this paper fails to substantiate this argument. The writer favors subcutaneous osteotomy in preference to the open method.

Treatment of Fracture of the Neck of the Femur.—C. E. Thompson,¹ at the Surgical Section of the American Medical Association, read a paper on this subject. The author quotes from the days of Sir Astley Cooper down to the latest literature obtainable. In conclusion he states that in all cases of fractured femoral neck firm bony union and use of the limb may be obtained; age is not a counterindication to treatment nor to obtaining bony union. Immobilization should be continued for a long time and 3 months should elapse before allowing weight on the limb. The Buck extension with weight and pulley is not sufficient immobilization to obtain bony union, but operative treatment in all the neglected cases has succeeded well, in fact, beyond all expectations, and deserves a place in surgery among the radical cures for troublesome conditions.

The Orthopedic Hospital Pelvic Rest.—R. A. Hibbs² presented a pelvic rest used in the application of plaster dressings after reduction of congenital dislocation of the hip. This rest, with its attachments for head and shoulders, holds the patient's body securely on a horizontal plane, thus making the application of the dressings less difficult than does the simple rest ordinarily used, which elevates only the pelvis and is also insecure.

A Review of Lorenz's Visit to the United States.—N. M. Schaffer³ tells of what may be called the aftermath of Lorenz's work in this country. With whatever reservations the medical profession may accept the methods of Lorenz, the social significance of his work to America remains. The author speaks of what measure of recognition has come in the way of provision for treatment and care of these cases. The operation for the reduction of the dislocation of the hip, as many know, is not new, but the one performed by Lorenz is practically the same operation that is described by many of the old classic writers for acute or recent dislocation. But the persistence and in many ways the originality of Lorenz in adapting it to a chronic (congenital) condition which only a few years ago was regarded by the medical profession as incurable is something

¹ Jour. Am. Med. Assoc., Jan. 3, 1903.

² N. Y. Med. Jour., Jan. 17, 1903.

³ Charities, Oct. 31, 1903.

for which he deserves great credit, and his successful effort marks an era in orthopedic surgery. The writer regards him as a master, and he feels that he is to-day without an equal in this particular field of manipulative work. The results obtained, so far as they can be definitely made out at this writing, show that of the patients operated on by Lorenz the usual percentage of success followed. In short, it may be said that nothing has occurred to reflect in any way seriously on the method which Lorenz taught and demonstrated. The cause of humanity has been advanced by his visit to the United States—a poor child suffering from disease and deformity has been lastingly benefited.

THE KNEE.

The Surgery of Rickets.—H. L. Taylor,¹ at the annual meeting of the American Medical Association, presented a very extensive paper on this subject. He concludes that subcutaneous osteotomy of the shaft is a safe and certain operation for the correction of knock-knees and bow-legs. Second, it is nearly always to be preferred to cuneiform osteotomy into the joint or operation by the open method. Third, the risk of nonunion of bone or other accidents, with asepsis and an experienced operator, is slight, and not increased in rickety subjects. Fourth, the commonest errors are imperfect correction, especially failures to overcome extension of the feet and relapses from improper dressings or from operating before the subsidence of the rickety process. Out of 42,124 new cases applying for treatment in 10 years at the orthopedic clinic of the Hospital for the Relief of Ruptured and Crippled, 6583, or over 15 %, suffered from rickets or the deformities most frequently caused by rickets, such as bow-legs and knock-knees or pigeon-breast. The classes in New York among which rickets are most common are the Italians, the negroes, and the Russian and Polish Jews, and it is these people who most notoriously sin against sanitary laws. It must be remembered that the malnutrition of rickets profoundly affects all the tissues, including the muscles, nerves, and glands, not merely the bones; the sweating, the weakness, the bronchial and intestinal catarrh, are evidences of the widespread nutritional vices which must be corrected if surgery is to succeed.

The Mechanical against the Operative Treatment of Rachitic Deformities of the Lower Extremities: A New Osteoclast.—R. T. Taylor² presents the following views on this subject: (1) In our dispensaries any immediate correction of the deformity which will obviate the expense of braces is desirable. (2) The danger of these operations need not deter us in the slightest degree, with modern asepsis, from resorting to the operative method. (3) A comparison of the length of time the child has to submit to discomfort from the plaster-of-paris bandages, versus the braces, is wholly in favor of the operative method. The writer presented a new osteoclast, devised on the lever principle

¹ Jour. Am. Med. Assoc., Oct. 11, 1903.

² Am. Jour. Orthopedic Surg., Aug., 1903.

instead of the screw, as seen in Rizzoli's, Grattan's, Colins's, and Lorenz's osteoclats. It consists of a T-shaped base, the arms of the T being some 12 inches wide and the stem some 36 inches long. Arising from the intersection of the arms on the stem is an arc some 12 inches high at its summit and 12 inches wide at its base. Some 3 inches above, and parallel with the stem of the base, is a movable half-inch square rod, which may slide backward and forward through slots in the arc. From the stem of the arc depends the sharp arm of the lever, some 9 inches down to its attachment to the movable rod. The advantages claimed for this device are the rapidity of the fracture and release, which cannot be obtained with the other osteoclats. It can be taken apart readily and carried.

The Surgical Pathology of Genu Varum and Genu Valgum.—W. Blanchard,¹ at the annual meeting of the American Orthopedic Association, presented an interesting paper on this subject. The writer states that advanced genu varum generally shows 3 contributing curves, the primary deviation being usually an exaggeration of the normal out-bend of the lower third of the femur. This is the typical first stage. Skiagraphs are shown of a typical case of genu varum and genu valgum, with the central deformity in the upper third of the tibia (Plates 8 and 9). In conclusion, skiagraphy seems to prove that the deformity of knock-knee and bow-leg is seldom, if ever, central in either the condyles or joint. It is stated that epiphysiolysis is hardly worthy of serious consideration when attempted with either osteotomy or osteoclasis; that osteotomy has some slight dangers from which osteoclasis is free, and the comparatively prolonged time taken for bony union and recovery should condemn it when osteoclasis is available.

Luxation of a Semilunar Cartilage at the Knee-joint.—F. Schultz-Dinsburg² reports the results in 33 cases confirmed by operation. He advises operation where the displaced cartilage can be demonstrated. The operation may be removal or stitching the cartilage in place. [The experience of American surgeons is decidedly against stitching a loosened cartilage. Complete removal has been the better procedure.]

Method of Correcting Flexion-deformity at the Knee-joint.—R. Whitman³ describes a method which consists of manual undulation in preference to the use of mechanical appliances. The patient is placed prone upon a flat table. The operator then holds with one hand the head of the tibia firmly against the table and with the upper quarter of the other begins forcible massage.

Lesions of the Tibial Tubercles Occurring during Adolescence.—R. B. Osgood⁴ has written an article describing in detail the development of the tubercle, its anatomy during adolescence, diagnosis and treatment of conditions affecting it. He concludes that an adolescent tibial tubercle is susceptible to injuries, especially in athletic subjects. These lesions are usually caused by violent traction of the quadriceps extensor. Fracture and complete separation of the tubercle are rare, cause loss of

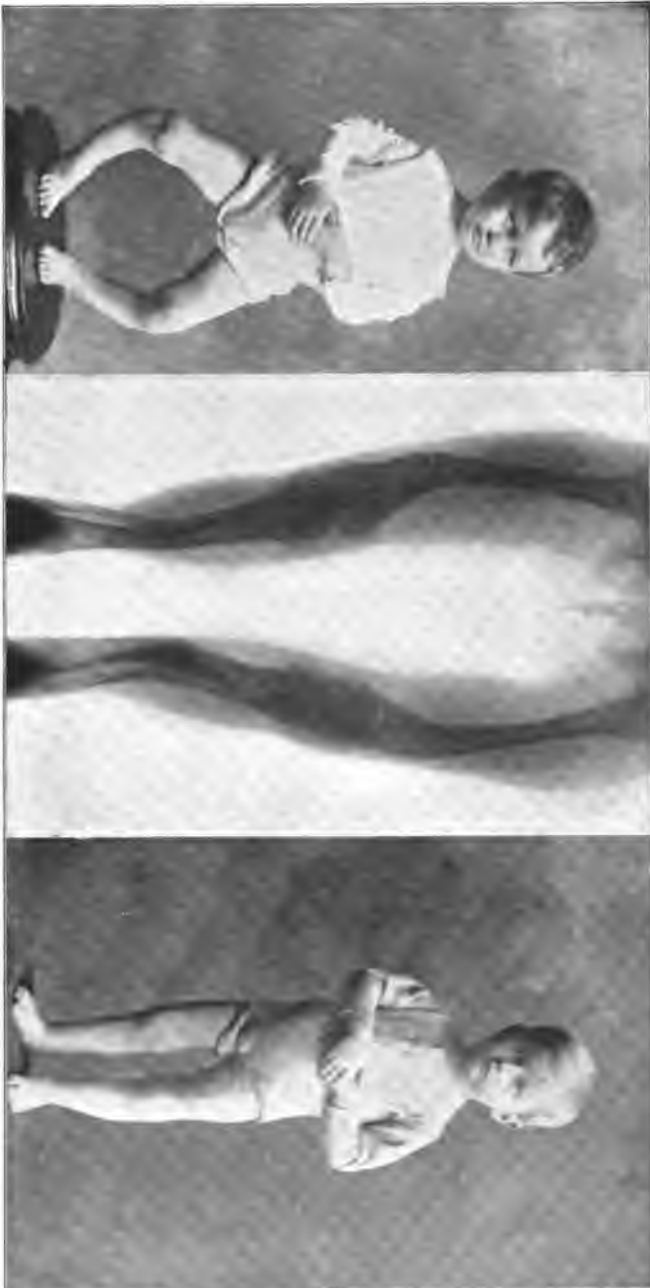
¹ Am. Jour. Orthopedic Surg., Aug., 1903.

² Arch. du Orth., 1903.

³ Am. Jour. Med. Sci., May, 1903.

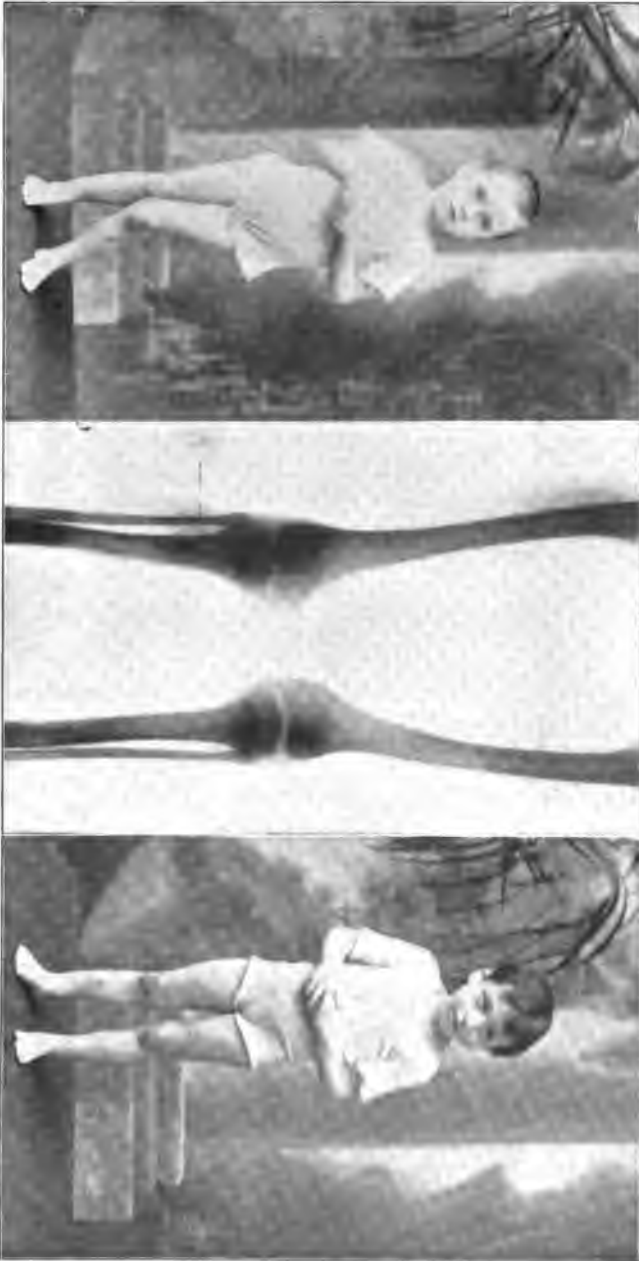
⁴ Boston M. and S. Jour., Jan. 29, 1903.

PLATE 8.



1. A typical case of genu varum. 2. Skiagram showing over-correction of the tibia at the apex of the deformity. 3. The same case six weeks after the operation, showing that the over-correction has assimilated into the general contour, producing symmetric legs (Blanchard, in *Am. Jour. Orthopedic Surg.*, Aug., 1903).

PLATE 9.



1, A case of bilateral genu valgum, with the central deformity just below the head of the left tibia. 2, Skiagram, with right and left reversed, after correction at the apex of the deformity in the tibia at letter A, showing the condyles of both legs to be practically normal. 3, The same case six weeks after correction (Blanchard, in *Am. Jour. Orthopedic Surg.*, Aug., 1903).

function, and are easily diagnosed, usually clinically and by means of the x-ray. [We have found these lesions peculiarly rebellious to treatment. Fixation before and after incision for a thickened periosteum must extend over weeks before relief is afforded.]

Lipoma Arborescens.—E. F. Painter and W. J. Erving¹ reported in detail 7 cases selected from a series of 16 cases of hypertrophied synovial villi recently removed at operations because they seemed to represent distinct tumor-formations and not simply the arborescent overgrowths of the synovial membrane which are so commonly seen. It becomes evident that the villi are not so limited as was at first supposed. The knee-joint is the one most commonly affected, though others are not exempt. In the series of cases presented all are operative and have come under observation during the past year. In general, the clinical symptoms presented by these cases are that of a more or less swollen joint, without any signs of an acute inflammation, and most commonly without any excess of fluid. The patient complains of imperfect function, sometimes with and sometimes without pain—more often the latter. German authors have described the condition more often than others, and have regarded the presence of these joint lipomas as representative of one or two conditions, as a rule: namely, synovial tuberculosis or arthritis deformans. Zeigler regards them as the result of a fatty metamorphosis of the normal synovial villi. König, writing in 1885 and again in 1895, considered the condition as a manifestation of tuberculosis, but finding later a similar condition in cases of arthritis deformans, he first tried to distinguish between them, and finally admitted the great difficulty in so doing. Haumann, in 1887, reported a case in which the condition was associated with a chronic rheumatoid affection. He, too, thought the structure favored the presence of tuberculosis. Israel reported a case following trauma in which no focus of tuberculosis was found. Sokoloff reported one case in the knee in which no tuberculous focus was found, one in which a focus was found, and one in a case of syringomyelic arthropathy of the shoulder, with the large joint cavity, atrophied humeral head, and luxated bone. From this last case he advanced the theory that a condition of negative pressure in a joint was also an etiologic factor in the growth of lipoma arborescens as favoring the hypertrophy of fatty tissue. Stieda, in his conclusions, states that it is not a lipoma in the sense of being a new growth, but it is merely a hypertrophy of normal preexisting tissue. Pathologically, it is a hyperplasia and fatty degeneration of preexisting synovial tabs, to an extreme degree. For the treatment he advised arthrectomy, or, when tuberculosis is present, resection of the joint. The authors recommend exploration of the joint when any doubt exists as to the nature of the pathologic process. They give tuberculosis relatively a less important place in the etiology.

¹ Boston M. and S. Jour., March 19, 1903.

THE FOOT.

The Occurrence of Painful Affections of the Foot among Trained Nurses.—R. W. Lovett,¹ after 500 observations upon normal and disabled feet, concludes: (1) That he has not been able to tell with any certainty by examination whether or not the feet of an individual are likely to give trouble. The only reliable information obtained in these cases was given by the impression seen through glass. A foot with a well-distributed pressure area seemed rather less likely to give trouble than one resting on two islands. The degree of pronation, the condition of the circulation, and the relative weight of the nurse and the dorsal flexibility of the foot have all proved of little or no value as elements in prognosis. A flat foot may be perfectly serviceable, as may also a severely pronated one, while an apparently well balanced foot may become painful. (2) The factors in causing the trouble among the nurses were to be studied rather in the general conditions than in any special formation of the foot. (3) The trouble was caused by rolling in of the foot and the shifting inward of its weight-bearing areas, and not in any of the cases observed by the breaking down or even lowering of the arch. (4) Although proof by figures is lacking, it is probable that the amount of trouble has been decidedly less than it would have been without the use of a proper boot. (See Plate 10.)

The Importance of Supplementing Tendon-transplantation in the Treatment of Paralytic Talipes by Other Procedures Designed to Insure Stability.—R. Whitman² states that in order to estimate correctly the permanent improvement derived from the operation of tendon-transplantation for a paralytic talipes, one should consider it apart from the procedures with which it is usually combined. The point to which particular attention is called is the importance of reinforcing the comparatively ineffective operation of tendon-transplantation by procedures designed to prevent deformity and to lessen the strain upon the weak muscles. The center of lateral motion of the foot, and consequently of lateral deformity, is the mediotarsal joint, and whenever the principle of abduction or adduction of the dorsal flexor is lost, the remaining muscles, although possessing power enough to raise the foot, at the same time draw it to one side or to the other. The most common and most important form of acquiring disability is that caused by paralysis of the tibialis anticus muscle, which last is always accompanied by valgus. The operation recommended in a typical case of this character is that described. When the calf muscle is paralyzed, and especially if the resulting deformity is of the calcaneovalgus or varus type, astragalectomy has been found to be the most effective operation. The forward displacement of the leg, removal of the cartilaginous surfaces of the opposing bones, transplantation of the peronei tendons of the os calcis, shortening the elongated tendon of Achilles, being minor parts of the operation. The object of operative treatment of paralytic patella is

¹ Amer. Med., July 4, 1903.

² Am. Jour. Orthopedic Surg., Aug., 1903.

PLATE 10.



Four nurses with flattened or pronated feet, who after months of service had been comfortable. These were classed as "suspicious" at entrance (Lovett, in Amer. Med., July 4, 1903).



Photographs of the standing position in five consecutive probationers at admission. These were taken to show the average foot, and in no one of the cases had there been any trouble (Lovett, in Amer. Med., July 4, 1903).

not perfect functional cure, but a restoration of ability to a degree that may enable the patient in favorable cases finally to discard apparatus. In this result, stability is the first essential.

The Abuse of Flat-foot Supports.—W. R. Townsend,¹ at the annual meeting of the American Orthopedic Association, contended that the treatment of flat-foot by means of some form of support under the foot is largely due to the excellent work of many members of this association, and it seems proper, therefore, that the attention of the profession should be called to the abuse of such supports. The fact that such a question is difficult of solution and that the methods promoting publicity are often purposely misunderstood is no reason why we should hesitate to give the proper advice, and urge upon medical men the necessity of properly examining and treating deformities or disabilities of the foot. The form of support will vary, individual preferences will prevail, but the treatment of flat-foot should be carried on by medical men. Supports, if used, should be correct in principle and properly made, and the routine practice of patients treating themselves or being treated by ready-made supports, sold by those with no knowledge of the anatomic or pathologic conditions actually present, should be discouraged. A discussion on this subject followed.

Further Experiences with a Modification in the Operative Method for Inveterate Relapses and All Chronic Forms of Pes Equino Varus.—A. M. Jonas² says that first the triangular flap is indicated in cases of pronounced talipes equino varus where the open operation is necessary to overcome a deformity which involves the medial dorsal. Second, the astragaloscaphoid ligaments and the joint and capsule must not be incised or torn. Third, when the division of the soft structures is not sufficient to overcome the varus deformity, an incision over the head and neck of the astragalus must be made and the bursa extirpated. Fourth, the head of the astragalus must be divided transversely with an osteotome. If this is not sufficient, remove a wedge from the neck; and if that fails, remove the head. Fifth, if the astragalus is rotated so that its superior articular surface is inclined outward, and replacement is impossible, the internal lateral ligament must be divided, which can be done through an opening made by the triangular flap. The best possible guarantee against relapses is to divide the soft parts and bones so that the foot falls into its natural position with little or no pressure. [We incline to question final results after such an extensive operation unless the good position secured at the operation is maintained many months in a non-removable dressing. The author should lay more stress on this point.]

Tendo Achillis Shortened for the Restoration of the Function of the Calf, Lost as a Previous Result of Tenotomy.—R. A. Hibbs³ has made a study of 18 cases in which the tendo Achillis has been divided for the relief of equinus following paralysis. The distinct object in view was in determining the question of whether or not the division of this tendon affected the function of the calf muscles. In this report it was

¹ Am. Jour. Orthopedic Surg., Aug., 1903.

² Jour. Am. Med. Assoc., Sept. 13, 1903.

³ N. Y. Med. Jour., May 2, 1903.

shown that in 11 cases the function of the calf was lost so far as being of value was concerned. It appears that by lengthening the tendo Achillis it must be expected that there will be still further shortening of the calf and modification of its function, which fact accounts to some extent for the results usually seen. It does not fully account for them, however, because in the 11 cases in which the function of the foot was practically lost, there was no such impairment of its function or lengthening of the tendon immediately after the operation as now exists, but Hibbs was convinced that after the patient began to walk the tendon gradually elongated, allowing still further shortening of the muscle and modification of its function. The writer believes that the preservation of the shaft and the preservation of the continuity of the tendon are absolutely essential, and that these cannot be secured except through an open operation. [We fail to be convinced by this report, as the observations he makes run counter to those made by orthopedic surgeons in many analyses comprising a much larger number of cases. While the paper may be suggestive, it is far from conclusive.]

Advances in the Treatment of Paralytic Difficulties.—A. H. Tubby¹ states that in spastic paralysis the success of tenotomy consists in preventing elongation of the bond of union and carefully guarding it until equilibrium of the opposing group of muscles has been established. He calls attention particularly to the necessity of reshaping the joint surfaces in old cases and putting the foot or the limb in fully corrected position and leaving no tension on the reinforced muscle.

MISCELLANEOUS.

The Family Physician, the Specialist, and the Patient.—Louis A. Weigel,² at the seventeenth annual meeting of the American Orthopedic Association, read a paper with this title. The writer spoke with reference to the education of a specialist. Although there is a tendency in modern times to send full-fledged specialists into the world, directly from college and university, and a few of the influential medical journals advocate such a course, he still believes that the specialist, to be successful, requires something more than the knowledge which he gains at school. The specialist is the person who is supposed to have an unusual amount of knowledge on a limited theme. If he is called in simply to give treatment or to aid diagnosis on that little point, perhaps that will do, but he may do harm if he sees that one point and overlooks the rest. In closing, he states that it is incumbent upon this Association to promote the development and improvement of orthopedics by insisting upon the proper qualification of men who are to take up this specialty. Perhaps the specialist of to-day may be defined as one who has given special attention and study to one branch of medicine in addition to a general knowledge of all other branches, such knowledge to be based on practical experience at bedside, in the home, for a sufficient length of time to broaden the mind and train his powers of observation and self-reliance.

¹ Lancet, March 28, 1903.

² Am. Jour. Orthopedic Surg., Aug., 1903.

Osteogenesis Imperfectiva.—Harbitz¹ describes the principal characteristics of this condition as being shortness of the extremities, with well-developed head and trunk. There is incomplete development of the bone centers of the head and face and imperfect ossification, especially marked in the long bones. Chondrodystrophy and osteogenesis imperfecta are entirely distinct, and to a degree opposite, conditions.

Treatment of Tuberculosis of Bones and Joints of Children after the Lannelongue Method.—M. Marta² has described the technic. The injections should not be made directly into the affected part, but only into the immediate surrounding tissues. Differing from Lannelongue, he at once applies a compression dressing and prefers to repeat the injection, which for the first time is not very strong. Out of 24 joints affected, he cured 14 with almost perfect mobility, 3 with 90°, 3 with 40° to 45°, and 4 with ankylosis.

The Malignancy of Joint Tuberculosis, Illustrated by a Series of 47 Cases.—C. F. Painter,³ before the American Orthopedic Association, read a paper on this subject. Its principal facts are epitomized as follows: (1) Tuberculous disease of the joints tends to recur after apparent cure in a considerable proportion of cases. (2) Recurrence is most commonly local. (3) Trauma, direct or indirect, is most frequently associated with recurrence. Indirect trauma is probably an exciting cause of recurrence, especially where partial ankylosis exists. (4) Patients who have suffered from bone and joint tuberculosis should be cautioned that they are not well when symptoms have ceased, and that reasonable care must be exercised to avoid recurrence. [Our own experience does not corroborate the first conclusion. We believe that a late recurrence is not the rule.]

Infantile Paralysis—an Epidemic of 38 Cases.—C. F. Painter⁴ has described in detail cases occurring in Gloucester, Massachusetts, during the summer of 1900. Reference is made in the article to numerous other epidemics which have occurred. The writer describes in detail the 38 cases seen in this epidemic. There was only one death, which was regarded by all those who saw the case as undoubtedly one of infantile paralysis. There were 23 males and 9 females. The youngest was 13 months and the oldest 10 years of age; 21 were 3 years or younger; 8 were 2 years or younger; 7 were 4 years or more. No patient observed got entirely well.

Habitual Luxation.—W. Wendel⁵ has considered the etiology of this condition as given by Joessel, Roser, Franke, and others. He describes Huesner's operation of deepening the sigmoid fascia; also the operation of Loch for habitual luxation of the elbow, and describes 3 cases operated in the Marburg clinic. Voluntary luxation is a curiosity, while habitual luxation is a disease.

Recent Advances in Orthopedic Surgery.—H. L. Taylor⁶ read before the American Therapeutical Society a paper in which he stated

¹ Zeit. f. orthop. Chir., xi, 3.

² Am. Jour. Orthopedic Surg., Aug., 1903.

³ Trans. Am. Orthopedic Assoc., 1902.

⁴ Trans. Am. Orthopedic Assoc., 1902.

⁵ Am. Jour. Orthopedic Surg., Aug., 1903.

⁶ Med. News, Oct. 10, 1903.

that orthopedic surgery justified itself not by definitions or by particular modes of treatment, but by results, due to wise selection and careful application of means rendered possible by special study and experience. The Lorenz operation illustrates the present tendency in orthopedics toward radical interference by simple methods. Cuneiform osteotomies have been justly replaced by linear, which are usually safer and just as effective. Early incision for joint diseases in children has been virtually abandoned as both unnecessary and unsatisfactory, and has been replaced by erosion or mechanical treatment. Excision of the knee in childhood is absolutely rejected, except to save life, on account of its enormous interference with the growth of the limb and the liability to secondary deformity. In adults joint incision may, for many reasons, be more freely employed. Another marked tendency in orthopedic work is the increase of interest manifested in pathology and the exact means of diagnosis. In some hospitals a culture is being made from all abscesses opened, and the x-rays are used, and used repeatedly, on practically every chronic joint. There has been a distinct increase of interest in and knowledge of nontuberculous lesions and processes in or near the joint. This tendency is well illustrated by the work of Goldthwaite, Painter, Foster. Finding, as they do, that many of the obscure knee affections of adult life are due to hypertrophied synovial fringes or racemose fatty tumors, hanging into the joint, brilliant advances have been made in the study of the chronic rheumatoid affections of the joints. The routine employment of the x-ray is laid to the discovery that chronic osteomyelitic foci are not uncommon, and that these may often be extirpated with the relief of long-standing and sometimes obscure symptoms. In addition to the transactions of the American Orthopedic Association, there are 3 German, 2 French, and 1 Italian journal devoted to this subject. About one-half the medical colleges in the Association of American Medical Colleges afford instruction in this branch. National Orthopedic Associations exist in England, Germany, and the United States, and the former is the oldest.

Report of Final Results in 2 Cases of Polyarthrititis in Children, of the Type First Described by Still, together with Remarks on Rheumatoid Arthritis.—R. Whitman,¹ before the Orthopedic Section of the New York Academy of Medicine, read an exhaustive paper on this subject. The joints most often involved are the knees, wrist, and spine. There was usually flexion deformity of the wrist, and in some instances lateral deviation of the wrist toward the outer side. The smaller joints of the hand were not affected. Still defines the disease as a chronic progressive enlargement of the joints, associated with general enlargement of the glands and of the spleen. He had personally observed 19 cases and had notes of 3 others, yet he confined his statistics to 12 cases. In 10 of these the disease began at or before the sixth year, and in 8 during the first three years of life. This type of disease must be uncommon in this country, and 2 were reported in detail because they present certain variations from those reported by Still. It can hardly

¹ N. Y. Med. Rec., Aug. 18, 1903.

be claimed that the cases reported as final results throw any light on the etiology of this form of disease. To one seeing only the autopsy the hypertrophied enlargement of the glands, the extreme emaciation, and the abnormal color of the deviated bones would certainly have suggested some general disease to which the joint lesion was simply incidental, but the history shows that the disease of the joint was, for a time, at least, the most important indication for treatment. The recovery of the second patient makes an interesting addition to the history of Still's disease. It is to be considered as a distinct affection.

General Treatment of Tuberculous Bone and Joint Diseases.—

J. E. Goldthwait¹ states that until the last few years the treatment has been considered to be largely local in nature, but that every effort should be made to better the patient's general condition. Out-of-door life should be insisted upon almost as much as in pulmonary tuberculosis. Forced diet is needed, and the best possible hygiene, both at home and when at work, should be arranged, and these features are not for a few months only, but should be observed by the patient the remainder of his life.

¹ Boston M. and S. Jour., Jan. 8, 1903.

OPHTHALMOLOGY.

By WALTER L. PYLE, M.D., AND SAMUEL HORTON BROWN, M.D.,
OF PHILADELPHIA.

The progress of ophthalmology may be conveniently considered under two principal headings, laboratory and clinical. Foremost in the laboratory group is the admirable work of R. L. Randolph on the role of toxins in the causation of ocular affections. C. Nicolai's series of experiments on frogs show the presence of muscular tissue in the optic nerves and suggest the possibility of the same condition in man. The origin of the vitreous has been made the subject of special study by Hamburger, who brings forth new facts in regard to this structure. Bernheimer demonstrates by his experiments the presence of uncrossed optic nerve-fibers in man. H. J. Parsons has performed a series of experiments of unusual interest in monkeys with a view to tracing the path of degeneration in the optic nerve and tract in the presence of brain-injury. Lucien Howe brings forward new methods for studying the orbital connective tissue. Great credit is due George M. Gould for his painstaking and elaborate biographic studies proving that the inexplicable chronic suffering of many prominent literary men was due to uncorrected or improperly corrected ametropia. His essays on eyestrain and civilization and eyestrain and the literary life will do much to popularize the importance of eyestrain in the production of many intractable symptoms, particularly those referred to the head. The many reasons why glasses have not relieved such symptoms, even when prescribed by physicians, is also a subject of an interesting and instructive paper.

The new clinical facts are derived largely from a study of statistics. The work of Barnes, Murray, Bickerton, G. D. Murray, and Pourquié in collecting statistics on the subject of color-blindness in the employees of transportation companies is noteworthy for its excellence. The examinations of the eyes of school-children have been carefully studied, statistically, by J. Kerr, and his suggestions will no doubt meet with general approval. In the domain of preventive ophthalmology the collection of statistics on the subject of contagious eye-diseases has been a prominent feature. The figures presented by Derby, Roosa, Standish, Davis, Bailey, Bey, Lakah, and Straub show that even trachoma has been greatly lessened in severity and in the number of cases by isolation and the more modern methods of treatment. In other subdivisions of ophthalmology statistical studies are likewise given prominence. Collins and Bronner show the practicability of lens-extraction in myopia by 47 cases. Casey

Wood and Brown Pusey review 78 cases of primary sarcoma of the iris and C. S. Bull gives an account of 5 cases of iridochoroiditis directly traceable to gonorrheal infection. Friedenwald describes 2 cases of tuberculosis of the iris and Jessop reports the same disease in the choroid in 2 instances. Barrett and Orr relate 8 cases of double optic neuritis in which the terminations differed from those usually described. C. S. Bull's observations after 94 iridectomies for glaucoma serve to corroborate the usual teaching.

Great advance has been made in radiotherapy. The beneficial result of the x-ray in the treatment of morbid growths is well attested by Sweet, Mayou, Stephenson, Walsh, and others. Sweet has used it in epithelioma, while Mayou, Stephenson, and Walsh have applied it with success in trachoma and tuberculous conjunctivitis. Radium has been accredited with most remarkable properties, most of which are doubtful, but the report of Javal and Curie as to its possibilities is entitled to consideration. The relation of the infectious fevers to ocular affections has been brought to the fore by the numerous reports of isolated cases. For instance, mumps was shown to be a cause of cycloplegia in 2 instances; ptosis followed influenza in 1 case; orbital cellulitis was a sequel to scarlatina in 2 cases; corneal ulcer was observed in 36 instances in variola; diphtheria induced optic neuritis in 1 case; and herpes zoster ophthalmicus was shown to be a cause of oculomotor palsy in at least 3 cases and optic neuritis in one case. Among the instruments, the siderophone is perhaps the most ingenious. The success of Dimmer in obtaining satisfactory photographs of the fundus oculi deserves more than passing mention.

AMETROPIA.

Eyestrain and Chronic Ill Health.—Considerable interest has been aroused by the publication of a series of "Biographic Clinics" by George M. Gould, which contain convincing proof that much of the chronic ill health of De Quincey, Carlyle, Darwin, Huxley, and Browning was due in great part to eyestrain. Gould believes that the early application of the proper correcting lenses would have given pronounced relief in each case. Since then he has made equally convincing studies of the lives of Herbert Spencer,¹ Richard Wagner,² Francis Parkman,³ Nietzsche,⁴ Whittier,⁵ Mrs. Carlyle,⁶ and Margaret Fuller Ossoli,⁷ all of whom suffered from pronounced asthenopic symptoms. An admirable summary of these biographic studies is included in a recent article on "The Role of Eyestrain in Civilization."⁸ Doubtless the author could find many other examples of eyestrain in prominent literary workers, but the 12 cases already studied are sufficient to impress the great truth of the importance of uncorrected or improperly corrected ocular defects in the causation of

¹ Amer. Med., March 7, 1903.

² Jour. Am. Med. Assoc. and Lancet, Aug. 1, 1903.

³ Boston M. and S. Jour., Sept. 17, 24, Oct. 1, 1903.

⁴ Biographic Clinics, vol. ii.

⁵ Cleveland Med. Jour., Sept., 1903.

⁶ Amer. Med., Aug. 8, 1903.

⁷ St. Paul Med. Jour., Dec., 1903.

⁸ Brit. Med. Jour., Sept. 19 and 26, 1903.

many obscure and intractable symptoms. As Gould says in his paper on "Eyestrain and Civilization"¹: "But it is not only and not chiefly its geniuses that concern medicine and a nation, when we consider the total effect of this factor. Civilization has tremendously and suddenly increased the eyestrain by a thousand occupations, which demand 'near-work' with the eyes. Printing, schools, and city life, give the matter an entirely new aspect. Sewing women, artisans, artists, machinists, musicians, clerks, typewriters, engineers, pupils, all the professional and business classes—these are the workers, spurred also to a continuousness of labor, such as has never been demanded, upon whom the obligation rests. The nation and the national medical profession that forgets or ignores this, overlooks a highly important element of progress. And it is one that is all the more effective because it conditions the peculiar means whereby modern civilization advances." The same author has also tabulated the causes of failures in many cases of eyestrain in which medical treatment has included attention to the eyes. The title of the paper is "Sixty-eight Reasons Why Glasses Did Not Give Relief,"² and a reading of it will be of interest to all physicians.

Asthenopia.—F. C. Hotz,³ in a paper on the misuse of glasses, pleads for the recognition and treatment of blepharitis and conjunctivitis in some cases, as conditions independent of ametropia. He recognizes the almost universal association of these conditions, but quotes cases in which glasses were of no benefit even in the presence of ametropia of low degree, and which were only relieved by local treatment. [This seems rather an argument for additional local treatment, than for the abandonment of correcting lenses.]

In considering the true status of eyestrain as a cause of numerous disorders, it is interesting to take testimony from both sides. A. R. Baker⁴ states unreservedly that **migraine and facial chorea are manifestations of eyestrain** and are relieved by the wearing of proper correcting lenses. He qualifies his statement by saying that these forms of chorea are not true chorea, but habit chorea. The entire claim is disputed by C. J. Aldrich,⁵ who brings forth overwhelming statistics to the contrary. In 3400 cases, he states, M. A. Starr failed to find true chorea induced by eyestrain. Krafft-Ebing in an analysis of 200 cases failed to detect eyestrain as a cause of chorea. Aldrich closes his criticism by a reference to Osler's and Ranney's opinions on chorea, and states that at best eyestrain is but an occasional exciting cause of chorea. He claims that migraine is an incurable neurosis and is influenced by eyestrain.

Eyestrain and Cataract.—The necessity of properly correcting ametropia in persons past middle age in an effort to retard the process of the ripening of cataracts is insisted upon by C. M. Culver.⁶ He states that neglected or faulty correction may increase the tendency toward opacification of the lens, and that the elimination of ametropia is of prime importance in the treatment of cataract.

¹ Amer. Med., Oct. 10, 1893.

² Med. News, Aug. 16, 1902.

³ Amer. Med., May 9, 1903.

⁴ Amer. Med., July 4, 1903.

⁵ Amer. Med., March 14, 1903.

⁶ Jour. Am. Med. Assoc., Nov. 22, 1902.

The association of asthenopia with malaria has recently been shown by J. L. Hiers,¹ Savannah. This observer states that malaria induces asthenopia of two forms, acute and chronic, and verifies this statement by the records of 20 cases in his own experience in which the diagnosis was rendered certain by the microscope and in which prompt antimalarial treatment afforded relief.

Changes in refraction of the eyes in the absence of well-defined pathologic changes have been noticed by many observers. S. D. Risley² has recently emphasized this fact by record of numerous personal observations. The suspicion of carelessness on the part of colleagues in the performance of routine refraction work will be greatly lessened by a fuller discussion of this subject.

Astigmatism.—Millikin³ reports a case of **very high mixed astigmatism**, in which during 11 years of observation there was an increase in the right eye from a total of 17 D. to 26.5 D., and in the left eye from a total of 10 D. to 14.5 D., the vision after each correction being $\frac{5}{8}$ in the right and nearly $\frac{5}{8}$ in the left eye. During this period the axis in the right eye changed from 90° to 100°. There were no gross pathologic conditions in either eye-ground, and the patient was able to use his eyes without discomfort at close work until 5 years ago, in the incessant visual strain of bookkeeping. He is very careful to keep his lens-frames accurately adjusted, and for his presbyopia he uses convex lenses in eyeglass frames to wear over his distance lenses. G. J. Bull,⁴ Paris, reports a case of astigmatism (—C. 1.75 axis 90°) in which a cure was effected by a complete **subconjunctival tenotomy** of the external rectus. Three days later the vision became normal and the patient was able to discard cylindric lenses entirely. Diplopia was present for a few days, but disappeared spontaneously. [While interesting, this report only shows the influence of the extrinsic ocular muscles in the production of astigmatism and does not open a new therapeutic field. Such uncertain surgical methods can never be satisfactory, and in ordinary cases of astigmatism they would be worse than useless.]

Hermann Knapp,⁵ in a plea for the modification of the customary **notation of the ocular meridians** so as to render it symmetric, proposes the following changes: "(1) The construction of a new plate on the spectacle frame for the left eye, placing zero on the nasal and 180° on the temporal side. (2) A diagram of the prescription with the same change for the optician marked *symmetric notation*, to distinguish it from the customary notation, which may be called homonymous. (3) Perimeter charts marked symmetrically, *i. e.*, zero at the nasal end of both horizontal meridians. Counting the meridians from the inner canthus up, along the brow, temple, and cheek to 360° or zero at the inner canthus. When these changes are made, there will be no confusion and we shall be accustomed to the new system in less than a week." [The disadvantages of such changes are obvious. The present system is satisfactory

¹ Med. Rec., Oct. 11, 1902.

² Ophthal. Rec., March, 1903.

³ Trans. Am. Ophthal. Soc., ix, 1902, p. 657.

⁴ N. Y. Med. Jour., Feb. 7, 1903.

⁵ Jour. Am. Med. Assoc., Sept. 13, 1903.

and commonly accepted in all mathematic calculations. The symmetry of the meridians may be determined easily by adding their axes; if the sum is 180, the axes are symmetric.]

Myopia.—Fromaget¹ reports the case of a young man who was rejected from military service on account of high myopia. He was wearing concave lenses of 6 diopters, with which he could not read at a distance of 25 cm. Without lenses he read with difficulty at 10 cm. For distance vision he preferred concave lenses of 9 diopters. Visual acuity was about $\frac{1}{4}$. There were none of the common myopic fundus changes, but the papilla was greatly congested. **Spurious myopia from tonic spasm of the ciliary muscles** was suspected. By skiascopy no more than 2.50 diopters could be made out. Under atropin cycloplegia he was found to have a small amount of compound hyperopic astigmatism. B. K. Chance² records 7 cases of **posterior staphylomas in myopic eyes localized to the nasal side** of the optic disk. After careful study of his cases this observer states that he regards the condition as being of congenital origin and not an expression of the changes incident to progressive myopia. J. E. Widmark³ states that **opacities of the cornea and astigmatism lead to myopia**. When occurring in both eyes, corneal opacities predispose to myopia; but if only one eye is affected, that eye seems protected and the myopia develops in the other. In support of this he adduces a number of his own cases. He believes convergence and accommodation to be potent in the production of myopia, but not to the great extent usually accepted.

Ablation of the crystalline lens in the treatment of high myopia is still enjoying a certain vogue in Europe, and the results of the operation are apparently satisfactory. Sir Wm. J. Collins,⁴ London, reports 7 such cases, in all of which vision was improved, and in some very great improvement was noticed. A. Bronner⁵ has removed the lens in 40 cases of high myopia, and states that the distant vision after the operation is not so good as one would expect; $\frac{5}{8}$ is rarely obtained and $\frac{6}{8}$ is not very common. The results with near vision, however, are better in most cases. Retinal detachment occurred in 2 of his cases in children under 16 years of age at periods of 6 and 14 months after the operation. Glaucoma was a complication in 4 cases, in 3 of which the symptoms were relieved by an iridectomy, but in one the cupping was permanent, the fields contracted, and the vision was only $\frac{6}{24}$. Large vitreous opacities appeared after the removal of the lens, permanently damaging vision. He does not consider choroidal changes as a contraindication to the operation, as in 12 of his cases such changes were present and good results were obtained. His method consists in performing discission and following it in a few days by extraction. After the age of 38 or 40 years, the ordinary extraction operation should be performed.

Decentering Lenses.—G. C. Savage⁶ gives the following rules to guide one in the decentering of lenses for near work: (1) If there is ortho-

¹ Jour. de Méd. de Bordeaux, March, 1902.

² Phila. Med. Jour., Dec. 20, 1902.

⁴ Lancet, Dec. 13, 1902.

³ Brit. Med. Jour., Nov., 1902.

⁵ Brit. Med. Jour., Nov., 1902, 1441.

⁶ Jour. Am. Med. Assoc., Nov. 22, 1902.

phoria, presbyopic lenses should be so placed that each visual axis will cut the optical center of its lens, when a point of fixation is in the extended median plane of the head. (2) If there is uncomplicated esophoria, both presbyopic lenses should be decentered directly out, and to an equal extent so that the two visual axes may cut the lenses to the nasal side of their optical centers, thus favoring the weak externi. (3) In esophoria complicated only by hyperphoria of one eye and cataphoria of the other, the decentering of presbyopic lenses should be confined to the lens for the hyperphoric eye and should be down and out, so as to develop a compensating esohypertropia of this eye. (4) In esophoria, complicated by hyperphoria of one eye and cataphoria of the other, with plus cyclophoria, the decentering of presbyopic lenses should be confined strictly to the lens for the hyperphoric eye and should be down and out so as to develop a compensating esohypertropia. (5) In simple exophoria each presbyopic lens should be decentered directly in and to an equal extent. (6) In exophoria complicated by hyperphoria of one eye and cataphoria of the other, the decentering of presbyopic lenses should be confined to the one for the cataphoric eye and should be in and up. (7) In exophoria complicated by hyperphoria of one eye and cataphoria of the other with plus cyclophoria, the decentering of presbyopic lenses should be confined strictly to the one for the cataphoric eye and should be in and up. (8) In hyperphoria of one eye and cataphoria of the other, with or without plus cyclophoria, the decentering should be confined to the lens for the hyperphoric eye and should be directly down. (9) In double hyperphoria, uncomplicated, both presbyopic lenses should be decentered directly down and to an equal extent. (10) In double cataphoria uncomplicated, if any decentering is necessary it should be directly up. (11) If there is plus cyclophoria only, in a presbyopic case, both correcting lenses should be decentered down.

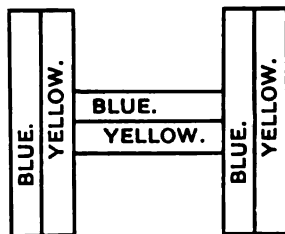


Fig. 102.—Starr's test letter (Jour. Amer. Med. Assoc., Nov. 8, 1902).

Tests for Vision.—Methods for the measurement of visual acuity are still being devised, some of which demand consideration. Bouchart¹ presents two new styles of tests. The first consists of squares of varying sizes, made of alternating bars of black and white. The width of the white and black bars is the same in each square, varying proportionately to the size of the squares, each of which contains one more of the white than of the black. The squares with the bars arranged vertically or horizontally are placed on a roller, similar to a camera film, and this can be rotated before an opening in the screen. The second design consists of plates which contain variously sized figures of round, square, lozenge, and elliptic shape. Some of the squares are placed at angles of 45°, while the lozenge and elliptic figures are arranged with their axes placed horizontally and vertically. Starr² suggests a test-letter made up of

¹ Recueil d'Ophthal., Sept., 1902.

² Jour. Am. Med. Assoc., Nov. 8, 1902.

two colors in order to produce a more sensitive test-object than the ordinary solid letter. By using a background of color the glare of light and retinal fatigue resulting therefrom is lessened and it is possible to utilize the phenomena of contrast of colors in such a way that the lessened illumination is not as advantageous as with the black letters and a white background. The letters are made up of two colors which are complementary, one-half of the letter being blue, the other half yellow (Fig. 102). The colors are laid longitudinally on each line of the letter, and the background is gray. A mixture of complementary colors produces gray, and a letter which is built up, in this way, of complementary colors will look gray to an eye which, through lack of proper focusing, receives the mixed colors on its retina. If, now, the letter is on a gray background as described, the eye cannot distinguish the outlines of the letter, and with proper adjustment of colors the letter will be quite invisible. A slight overlapping of the colors, from imperfect focusing, gives the letter a gray appearance, and a lens which corrects this overlapping and brings each color sharply into focus produces a much greater contrast than is the case with a black solid letter on a white ground.

Colored Vision.—C. Pino¹ from some individual experiences concludes that **erythropsia** is a complementary after-image of yellow-green light, which originates when white light passes the capillary blood in the inner layers of the retina, and which shows its effect only when the retinal purple of the rods has disappeared through excessive illumination, as the function of this purple consists in neutralizing these yellow-green rays. He also thinks that the blue-violet which he sometimes noticed in his experiments must be considered as a positive after-image of the color-proper of light. For white light to reach the macula it must be of a bluish-white tint on account of the yellow pigmentation of that locality. With excessive illumination more blue rays will reach the retina than the yellow pigment can absorb, so that a part penetrates toward the percipient layer. The blue color is not seen through the intensity of the light, but manifests itself in the after-image.

A. M. Davis² reports the occurrence of **chromatopsia** following a **normal labor**. The visual disturbance was preceded by insomnia and was manifested by every colored object in the room appearing yellow, while dark objects appeared absolutely black. The condition was accompanied by an inability to concentrate the sight upon objects except for a very short period after having had the eyes closed for a time [evidently a paresis of accommodation].

TESTING THE EYESIGHT OF SCHOOL-CHILDREN.

The recent results of this work have been more or less uniform. James Kerr,³ in his report of the ophthalmic examination of the London school-children, contributes some interesting data upon this subject. Recent examinations were made by oculists. The examiners distin-

¹ Weekbl. v. Geneesk., May 3, 1902.

² Amer. Med., March 14, 1903.

³ Brit. Med. Jour., March 14, 1903.

guished the vision in their returns as good ($V = \frac{6}{8}$), fair ($V = \frac{6}{9}$ or $V = \frac{6}{12}$), and bad ($V = \frac{6}{18}$ or worse). Kerr makes reference for comparison to the vision testing done by the teachers in 1900. There is an association between defective visual acuity and retarded position in school. If the children be divided into two groups—of precocious children (younger than the average age in their standard), and retarded children (older than the average age for their standard), then, although when considering the whole of the children the younger ones have most defective vision, yet in this grouping the older “retarded” group present more defective vision than the younger “precocious” group. Probably this means not only that defective vision retards progress in school, but also that the mentally backward children do not respond to the visual tests so well. This last idea is borne out by the fact that the oculists’ more experienced testing found less slight defect (fair vision), by about 25 % at each age of all examined, than the teachers; and, in testing very young children, the greater the time and trouble taken, the less the proportion of defects found. The conclusions as to visual conditions in school may be summed up as follows: (1) The percentage with normal vision increases with every year of age and standard of absence during school life, reaching 80 % with Standard VII. (2) All through school life 10 % have “bad” vision—this remains about a constant proportion. (3) The greater part of the defective vision is due to slight defect, which gives imperfect but fair vision, due probably both to mental and ocular conditions, and of greatest importance educationally in the first half of school life. (4) Very bad visual acuity ($\frac{6}{18}$ or worse), due to accident, disease, and probably also to spasm and myopia, is met with in a small proportion, increasing regularly from 1.5 % in Standard I to 3.5 % in Standard Ex-VII. Educationally, the standard of normal vision need not be adhered to; all children with vision equal to $\frac{6}{9}$ or $\frac{6}{12}$ should, however, be known to the teacher. The 10 % of children with bad vision ($\frac{6}{18}$ or worse) require special arrangements in school, and should be compelled to have attention paid to this, and, if possible, medical advice with a view to improvement. Such children are detected by the teacher’s testing as readily as by an oculist’s more careful work; and for practical purposes any future arrangements should be based on each child’s distant vision under working conditions, being tested and recorded by the teacher at least once a year. A list of such children ($V = \frac{6}{18}$ or worse) in each class should be suspended in the class-room and kept up to date. The teacher should make frequent examinations of all the children, and this should be supplemented by annual examinations of those whose sight is defective.

OCULAR MUSCLES.

C. Nicolai¹ observed **forward movement of the optic disk** in frogs after punctures of the anterior chamber postmortem, and concludes that muscular tissue must be situated here which contracts on the sudden diminution of tension in the vitreous chamber. This muscle he terms

¹ Verd. d. Koninklyke Akad. v. Wetensch 2 sectie, dl. IX, no: 3.

"*musculus papillæ optici*," and claims that it is responsible for the cases of papillitis in which the nerve is unaffected and which respond to the salicylates and iron. In further support of his claim he brings forth microscopic sections of the papilla which show muscle-cells and fibers in this situation.

Nystagmus, the causes of which are well known, has been recently shown to be influenced greatly by heredity. T. Fisher¹ reports an instance of lateral nystagmus unassociated with disease of the choroid, lens, or retina, occurring in a child aged 5 months. The condition probably existed from birth. The father, aged 21, was similarly affected, and had been so, it was reported, from his birth. Isaiah Frank² relates a case in which nystagmus was present and was transmitted to 1 child and 6 grandchildren. The patient had been married twice; 1 grandchild of the first wife and 5 of the second had the affection, showing that the transmission was through the father. Greanelle³ gives an account of a family in which 2 children, the mother, and the grandfather were affected with congenital nystagmus. There were no gross lesions to account for the condition. All the members of the family were brunets. C. O. Hawthorne⁴ and M. M. Sinclair⁵ also record, independently, cases of nystagmus in 3 generations. E. Stieren,⁶ Pittsburg, describes a case of a boy 6 years of age in whom there was a congenital absence of both inferior recti muscles.

A simple method for the determination of the degree of deviation in squint has been devised by N. M. Black.⁷ It consists of a wooden base supporting an upright. At right angles to the center and top of this upright is attached an arm which can be turned to the right or left at the center of the upright. A scale of degrees is marked on the back of this arm. The light is furnished by a long miniature movable electric lamp that may be lighted or extinguished at will. [This is an ingenious adaptation of the perimeter test, over which it possesses the advantage of its convenience.]

A. E. Prince,⁸ in considering **section and resection of recti muscles for cosmetic purposes**, in cases of squint inoperable by tenotomy or advancement, reaches the following conclusions: (1) In the case of complete paralysis of either internal rectus, the resection of the opposing muscle will enable the eye to be retained in the straight position without motion in that meridian. (2) In a case of retraction of either rectus into the orbit under conditions rendering its advancement impossible, an equalization of the deviating power is to be obtained through section of its antagonist, posterior to its capsular attachment, following which, excursions in that meridian will be restored to an extent varying between 20° and 50°. (3) In case of paralysis or retraction of either rectus, the operation of section or resection of its antagonist has not been observed to develop or increase any preexisting exophthalmus to any marked degree.

¹ Brit. Med. Jour., Sept. 6, 1903.

² Pediatrics, Feb., 1903.

³ Brit. Med. Jour., May 23, 1903.

⁷ Ophthal. Rec., Nov., 1902.

⁵ Med. Rec., Jan. 31, 1903.

⁴ Brit. Med. Jour., Feb. 21, 1903.

⁶ Amer. Med., April 11, 1903.

⁸ Am. Jour. Ophthal., Sept., 1902.

F. C. Todd¹ describes an improvement in the instrument originally devised by him in 1902 for the **operation of tendon-tucking** in advancement of the muscles. The accompanying illustration (Fig. 103) shows the new features to advantage.

Paralysis of the Ocular Muscles.—While it is a common practice to consider the acute infectious fevers as causes of ocular palsies, reports of such cases are somewhat rare. Diphtheria is perhaps the most frequently encountered cause. Jacqueau² reports a case of complete ptosis in a man 53 years of age following influenza. It occurred first in the left eye, and within 24 hours appeared in the right eye. Bagneris³ describes a case in which paralysis of accommodation followed an attack of mumps. A similar condition accompanied by palsy of the velum palati was observed by Mandonnet⁴ in a child of 9 years as a result of this disease. Herpes zoster ophthalmicus, while not usually classified as an infectious fever, is occasionally attended by oculomotor palsy, as is shown by the records of cases reported by W. Zentmayer⁵ and J. W. Barrett and W. F. Orr.⁶ That internal ophthalmoplegia may be caused by ergot is shown in a case reported by P. Schneider⁷ in which both eyes were affected during the daily administration of the drug. Accommodation and convergence returned on its withdrawal.

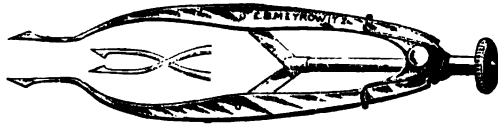


Fig. 103.—Todd's instrument for tendon-tucking.

Total unilateral oculomotor palsy has been observed by Lindner,⁸ in a woman aged 42, attended by violent headache, vomiting, and tinnitus aurium. Optic neuritis and retinal hemorrhage were present in addition. The symptoms subsided gradually and the patient was comparatively well with the exception of the oculomotor palsy, which persisted. Three and a half years after the onset of the condition she fell over unconscious and developed a right-sided hemiplegia, from which attack she died shortly afterward. Postmortem examination revealed the presence of a pea-sized aneurysm of the left internal carotid artery which had pressed on the oculomotor nerve and later ruptured into the left ventricle.

Myasthenia gravis and its ocular manifestations have been considered recently at length by W. R. Gowers,⁹ C. S. Myers,¹⁰ and C. D. Westcott and Brown Pusey.¹¹ The chief characteristic of this affection is general feebleness of all the muscles with quick exhaustion after use and electric stimulation, with equally rapid restoration on rest. There is no loss of power in the ocular muscles, the condition thereby resembling

¹ Ophthal. Rec., March, 1903. ² New Orleans M. and S. Jour., April, 1903.

³ New Orleans M. and S. Jour., Feb., 1903.

⁴ Annales d'Oculistique, March, 1903.

⁵ Amer. Med., Oct. 27, 1902.

⁶ Intercol. Med. Jour. of Australasia, July 20, 1902.

⁷ Münch. med. Woch., No. 39, 1902.

⁸ Wien. klin. Woch., Nov. 6, 1902.

⁹ Brit. Med. Jour., May 24 and 31, 1902.

¹⁰ Jour. Path. and Bact., Sept., 1902, viii, No. 3, p. 306.

¹¹ Jour. Am. Med. Assoc., July 11, 1903.

strongly at first sight ophthalmoplegia from nuclear degeneration. One of the distinguishing features is the greater escape of the muscles moving the eyes downward and the implication in varying degree of those moving the eyelids upward. The lateral muscles are constantly but irregularly affected. The light-reflex is usually perfect. In Myers's observations the ciliary muscle was unaffected, but in the cases of Gowers, Westcott, and Pusey accommodation was markedly interfered with. The refraction undergoes variations. Ptosis is usually present. Periodic exacerbations and remissions are characteristic of the affection.

EYELIDS.

Mori and Rikuji, Yarmamoto,¹ report a very unusual case of **gangrene of the eyelid** in a poorly nourished infant 1½ months old. The lesion was triangular in shape at the right outer canthus and measured

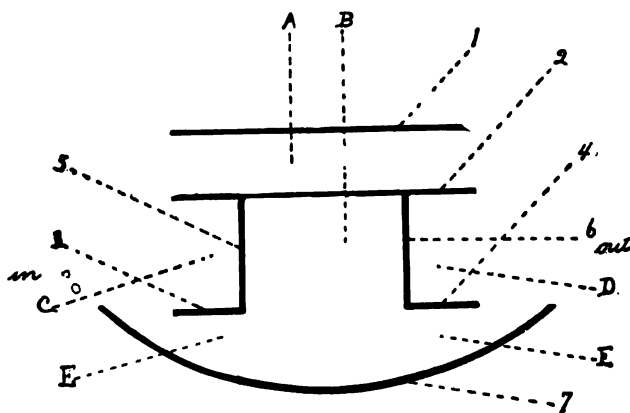


Fig. 104.—Allport's modification of Panas's operation for ptosis: 1, First incision; 2, second incision; 3, third incision; 4, fourth incision; 5, fifth incision; 6, sixth incision; 7, edge of upper lid; A, bridge flap; B, tongue flap; C, nasal flap; D, temporal flap; E, palpebral flap (nasal side); F, palpebral (temporal side) (Jour. Am. Med. Assoc., April 11, 1903).

1.5 cm. by 1 cm. Bacteriologic examination revealed the presence of diphtheria bacilli, but the mucous membranes elsewhere remained normal. The patient eventually died despite the serum-treatment. **Spontaneous gangrene** or noma has been observed by F. W. Marlow² in an infant 3 weeks old. The condition began as a pimple and rapidly ulcerated, destroying both lids and ultimately terminating in death from exhaustion.

Vicarious menstruation from the lids is an interesting affection occasionally reported. C. J. Herbert³ describes a case of this character occurring in a young Jewess, who since the establishment of menstruation at 13 years of age had noticed oozing of blood from the lower lids about 2 or 3 days previous to each period. Treatment did not influence the condition.

¹ Abstr. Annals of Ophthal., Jan., 1903, p. 172.

² Ophthal. Rec., Dec., 1901. ³ Jour. Am. Med. Assoc., Sept. 13, 1902.

The treatment of epithelioma of the lids has always been unsatisfactory, and the remedies advised are legion. W. B. Marple¹ relates a case in which the affection was cured by the local application of adrenalin (1 : 1000). W. M. Sweet² proves conclusively by the reports of his cases that the method of treatment by the x-ray is no longer experimental in character.

Lid-operations.—Among the new lid-operations of the past year F. Allport's³ modification of Panas's operation for ptosis deserves special

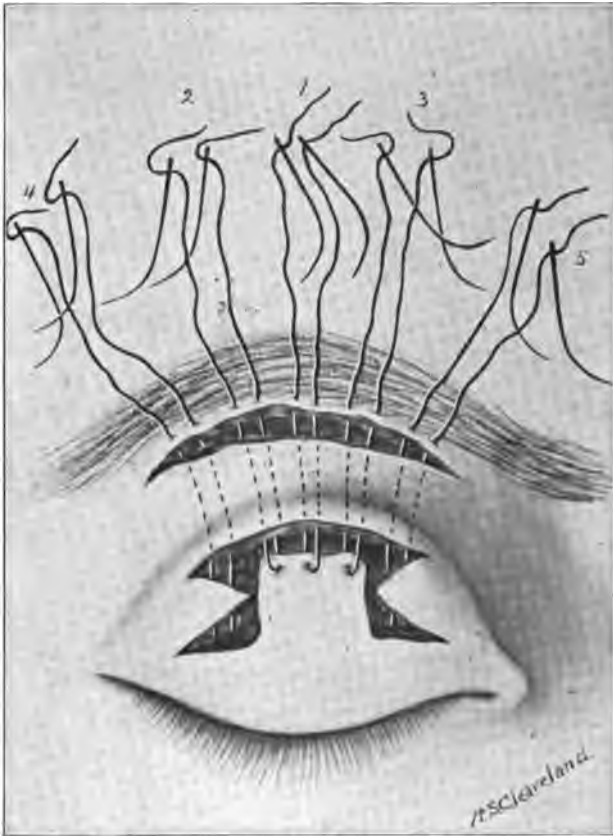


Fig. 105.—Allport's modification of Panas's operation for ptosis: 1, First suture; 2, second suture; 3, third suture; 4, fourth suture; 5, fifth suture (Jour. Am. Med. Assoc., April 11, 1903).

mention. The accompanying diagram (Fig. 104) gives the outlines of the incisions advised by Allport. The second illustration (Fig. 105) shows the manner in which the sutures should be introduced. The puckering of the lateral flaps after the sutures are drawn tight is avoided by cutting off their corners and suturing them to the adjacent upper and lower flaps.

¹ Med. Rec., August 23, 1902.

² Amer. Med., Dec. 13, 1902.

³ Jour. Am. Med. Assoc., April 11, 1903.

On completion the eyelid has the appearance shown in the third illustration (Fig. 106).

In considering the blepharoplastic operations for **cicatricial ectropion**, F. C. Hotz¹ contributes some very interesting points. For ectropion of the upper lid he advises making an incision starting from a point 5 mm. above the inner canthus, extending upward in the shape of a curve to the limit of the cicatrix, and terminating 5 mm. from the outer

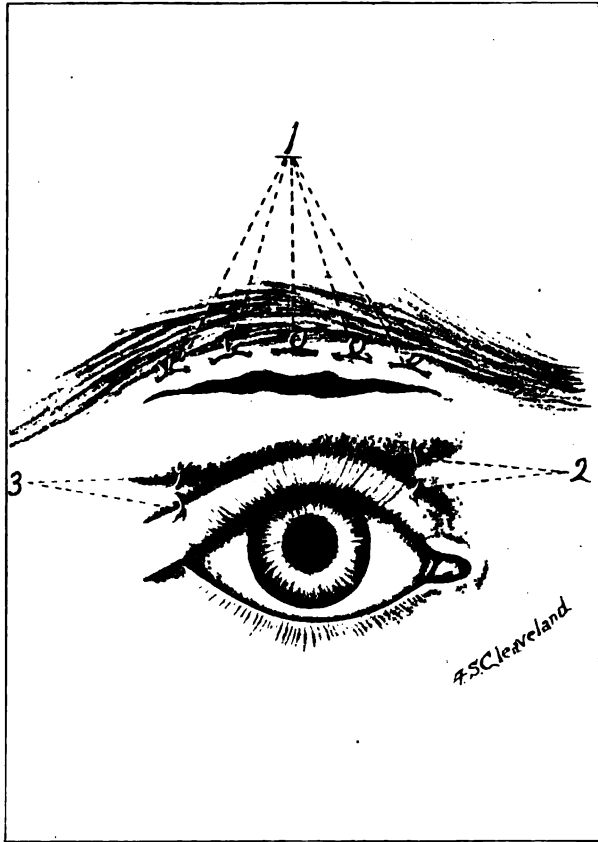


Fig. 106.—Allport's modification of Panas's operation for ptosis: 1, Sutures 1, 2, 3, 4, 5, after being tied 2 and 3, sutures in flaps C and D after being tied (Jour. Am. Med. Assoc., April 11, 1903).

canthus. This flap is then carefully dissected up from the underlying scar-tissue as far as the lid border. The lid is then released by dissection from all cicatricial connections until it can be easily turned down into its normal position, and now the edge of the lid-flap is sutured to the upper border of the tarsus. Two ligatures may be passed through the lid and fastened to the cheek until union has occurred, especially if it

¹ Jour. Am. Med. Assoc., May 2, 1903.

is necessary to use a Thiersch graft. A reversal of the incision, flap, and ligatures is necessary for operation on the lower lid. A. E. Ewing¹ describes a modification of his original entropion operation on the lower eyelid. A modification of Desmarre's clamp is used to evert the lid, after which an incision parallel to the free margin of the lid and extending throughout its entire length is made. The muscle-fiber should be exposed throughout the entire wound. The partially detached marginal strip is then turned over by forceps or ligatures in order to widen the incision. Three sutures are then passed through the conjunctival margin of the incision through the tarsus, penetrating the bottom of the wound and emerging on the dermal surface of the lid. The needles are then reentered on the same horizontal line, but 3 mm. distant from their points of exit, emerging at the edge of the marginal strip. The ends are then tied moderately tight and serve to completely evert the marginal strip.

LACRIMAL APPARATUS.

J. W. Wamsley² has devised a new form of **drainage-tube** for insertion into the nasal duct in cases of stricture. It consists of a coil of 14 or 18 karat gold wire, No. 30 gage, made in the shape of a short lacrimal probe and varying in caliber. For average use he prefers one about 3.5 mm. in diameter. His method of treatment consists in first introducing a short thick aluminum probe, allowing it to be retained for a few days until reaction subsides. He then passes an introducer into the duct and measures its length and withdraws. The gold wire tube is placed on the introducer to the required length and both are passed into the duct, after which the introducer is withdrawn, leaving the wire coil to maintain permanent dilation of the duct. Priout³ records a case of **acute dacryoadenitis** produced by the ingestion of 18 grains of potassium iodid for a period of 9 days. [A condition known as angioneurotic edema is not infrequent in this region in individuals susceptible to the iodids, and resembles this affection very closely.] Panas⁴ reports a case of **tubercular syphilis** in the region of the left lacrimal sac, and DeLapersonne⁵ describes a case of **primary syphilis** of the eyelid and lacrimal gland. Among the extremely rare lacrimal conditions is **actinomycosis**. Such a case has been observed recently by Guibert⁶ in a leather-worker, 34 years of age, affecting the inferior canaliculus. Microscopic examination showed typical actinomycotic structures. C. J. Kipp⁷ observed a case of **streptothrix** in the lower canaliculus in a man 28 years of age who complained of a swelling in the region of the inferior canaliculus and lacrimation. A concretion 9 mm. long and 6 mm. in diameter was removed and examined microscopically. **Tumors** of the lacrimal gland are always of infrequent occurrence and may be confused with pseudotumors of that structure. This fact is readily demonstrated by Coppez⁸ in his report of 5 such enlargements, 3 of which were

¹ Am. Jour. Ophthal., Feb., 1903.

² La Clin. Ophtal., Oct. 10, 1902.

³ Arch. d'Ophtal., Dec., 1902.

⁴ Arch. of Ophthal., July, 1902.

⁵ Société Belge d'Ophtal., in Ann. d'Oculistique March, 1902.

⁶ Phila. Med. Jour., Dec. 20, 1902.

⁷ Arch. d'Ophtal., Dec., 1902.

⁸ La Clin. Ophtal., Nov. 10, 1902.

sarcomas and 2 were dislocated lacrimal glands. In operations in which infection is liable to take place through the tear-passage F. Buller¹ advises ligation of the canaliculi by passing a No. 2 iron-dyed silk ligature around the canal a little to the inner side of the punctum and tying it as tightly as possible.

Extirpation of the lacrimal sac for the relief of dacryocystitis has been performed by E. Rollet,² who believes that in the majority of cases the affection may be entirely cured by the operation. In 27 cases seen by him only 3 were total failures; abnormal lacrimation was absent in 16, insignificant in 2, intermittent in 4, and persistent in 3 cases. In the suppurative cases there was no subsequent ectropion or disfiguring cicatrix.

CONJUNCTIVA.

Kikutsi³ relates a case in which a Chinese doctor made effort to remove a nevus from the eyelid by **vaccination**. The procedure was successful, but was attended by a most intense mucopurulent conjunctivitis and fever. Marczel Falta⁴ calls attention to itching as the most prominent symptom of **vernal catarrh**, and uses this symptom for differential diagnosis. He states that upon rubbing the lid itching is intensified, while a similar manipulation in trachoma produces no symptoms, unless possibly pain.

A. V. Lotine⁵ reports a case of **conjunctivitis due to the presence of the larvas of Wohlfahrt's fly** (*Wohlfahrtia magnifica schinerii*) in the conjunctiva. The rarity of this condition demands its consideration. The first case was reported by Wohlfahrt in 1770, and almost 100 years later Schiner, an Austrian entomologist, described the fly under the name of *Sarcophela magnifica*. The larvas are white with transverse minute black striations. They measure 0.5 cm. in length and 1 mm. in width. Coppez⁶ gives the history of a case of conjunctivitis in a boy of 8 years in which thin filaments of mucus containing leukocytes and desquamated epithelium were constantly discharged, greatly disturbing vision. Treatment seemed to increase these filaments. C. O. Hawthorne⁷ describes a case of **arthritis accompanying ophthalmia neonatorum**. The joint-complications were mild in character and the efficiency of the affected joints was promptly restored by treatment.

H. D. Bruns⁸ says he is aware of no study of the relative liability of the white and the negro to attacks of **phlyctenular ophthalmia**, nor has any one called attention to the greater severity of the malady and its curious varieties in the latter race. Of 17,311 eye cases in his clinic, 5052 were cases of conjunctival disease. Of these, 2002 were colored and 39 % were phlyctenular cases. Of 3050 whites, only 14 % were phlyctenular cases. The period of life over which liability to attack

¹ Trans. Amer. Ophthal. Soc., 1902, p. 633.

² Lyon Méd., March 22, 1903.

³ Abstr. Ann. of Ophthal., Jan., 1903, p. 172.

⁴ Arch. f. Augenheilk., Aug., 1902.

⁵ Roussaky Vrach, Feb. 1, 1903.

⁶ Jour. méd. de Bruxelles, Oct. 23, 1902.

⁷ Reports of Soc. for Study of Children, vol. ii, London, 1902.

⁸ New Orleans M. and S. Jour., Aug., 1903.

extends is longer in the negro than in the white. The disease is much more severe in the negro, many of the cases being almost hopeless. Bruns gives tables showing the effect of local treatment with mercurials alone, mercurials with other agents, and without mercurials. He interprets them as showing that local treatment has but little to do with the progress of the case.

Trachoma is compared to adenoids of the nasopharynx by R. Opdyke,¹ who believes that a close analogy exists between them. He states that one out of every two children with trachoma examined by him in the New York schools had adenoids, and he considers that these vegetations are important etiologic factors in granular conjunctivitis. Myles Standish² disputes this, and states that follicular conjunctivitis is confused with trachoma in this respect, and that the analogy does not extend to the latter condition. Von Arlt³ employs cuprocitrol in the treatment of trachoma, by means of a glass rod over granulations in the conjunctival sac, followed by gentle but thorough massage. In advanced cases he uses a 10 % ointment 3 times a day, decreasing the strength as the case improves, or if the applications cause pain. In a few cases cuprocitrol is not tolerated, and in these Von Arlt uses a dusting-powder of itrol. He speaks favorably of this substance, but warns against its susceptibility to deterioration from exposure to light and to the products of combustion of illuminating gas. Niemtchenkov,⁴ a Russian military surgeon, advises subconjunctival injections of a 5 % aqueous solution of carbolic acid solution in the treatment of trachoma. Niemtchenkov has thus treated with great success 43 patients. M. S. Mayou⁵ reports a case of trachoma cured by the x-ray. He points out that there is less destruction, less pain, and less cicatrization than in other radical methods of treatment. Sydney Stephenson and D. Walsh⁶ also record 2 similar cases. In one case 17 exposures were required and 6 in the other, with an average exposure of 10 minutes at a distance of about 8 inches from the tube. The results were the same with closed as with open lid. H. R. Elliot⁷ states that peritomy is entitled to greater recognition than it receives. Trachoma, while severe in parts of Continental Europe, receives more attention there than it does in India, where Elliot practises, and consequently neglected cases of pannus are less frequent. In 500 cases Elliot has never seen the operation of peritomy fail to be of benefit. He advises the excision of a strip of conjunctiva not more than 6 mm. in width. S. Snell⁸ is likewise an advocate of this operation in vascular conditions of the cornea, corneal ulcers, and detachment of the corneal epithelium.

Growths.—**Papilloma of the conjunctiva** and cornea has been observed by R. H. Johnston⁹ in 2 cases, in both of which the diagnosis was confirmed by the results of a microscopic examination. In differentiating this condition from epithelioma Johnston lays great stress on

¹ Med. Rec., Jan. 3, 1903. ² Boston M. and S. Jour., cxlvii, No. 14, p. 367.

³ Wien. klin. Woch., May, 1902.

⁴ La Sem. méd., May 28, 1902.

⁵ Brit. Med. Jour., March 28, 1903.

⁶ Lancet, Jan. 24, 1903.

⁷ Lancet, June 6, 1903.

⁸ Lancet, May 30, 1903.

⁹ Ann. of Ophthal., July, 1903.

the following characteristics: epithelium of the skin or mucous membrane from which the tumor springs, more or less proliferated in a regular and orderly manner; squamous, polyhedral, and cylindric from without inward; connective tissue bound together and containing blood-vessels, the essential characteristic of the connective tissue being papillas corresponding in some or all respects to the papillas of the skin. His report, in its entirety, may be considered as a plea for early microscopic examination of all tumors of the conjunctiva with a view to preventing enucleation as a result of mistaken diagnosis. H. V. Würdeman¹ reports a case of **papilloma** of the myxofibromatous type occurring on the conjunctiva in a child of 10 years (Fig. 107). Excision was necessary for the removal of the granulations. L. A. W. Alleman² presents a case of **amyloid degeneration** of the conjunctiva in an Italian woman, 54 years old. Microscopic examination confirmed the diagnosis. Swelling and induration of the lids were prominent features and the conjunctiva appeared tightly stretched over a waxy mass of an indescribable yellowish-red color.



Fig. 107.—Papillomatous degeneration of the conjunctiva (Würdeman, in *Ann. of Ophthal.*, vol. xi, No. 4, 1902).

Molluscum contagiosum of the conjunctiva has been observed by Th. Balaban.³ The growth attained the size of a hazel-nut and was situated on the bulbar conjunctiva, extending from the outer commissure nearly to the cornea. It was firmly attached to the conjunctiva, but was freely movable on the underlying tissue. The growth was removed and subjected to a microscopic examination the results of which rendered the diagnosis

positive. Healing was prompt after the operation. J. R. Bordley⁴ contributes some new statistics on the subject of **tuberculosis** of the conjunctiva. His figures cover 84 cases collected since 1870. Most of the infections occurred in people ranging from 10 to 30 years, although no age seemed exempt. Of the patients, 62 % were females; 25 of the cases followed as secondary infections; in 10 % of the primary infections the health was very poor; 15 cases were ascribed to traumatism; 2 cases followed operations for strabismus, and 1 developed as a tarsal cyst. The right eye was affected in 47 % of the cases, the left eye in 40 %, and both eyes were involved in 13 %. The lesion originated in the conjunctiva of the upper lid in 33.5 % of the cases, in that of the lower lid in 15.5 %, in the bulbar conjunctiva in 12 %, and in the palpebral and bulbar conjunctiva in 6 %. Sydney Stephenson⁵ reports a case of tuberculosis of the conjunctiva in which a cure was effected by *x-rays*. The affected conjunctiva was treated by exposure to the *x-rays* at a distance of 6 to 10 inches from the focus tube for an average period of 10 minutes at each sitting. This observer also reported⁶ a previous

¹ *Ann. of Ophthal.*, vol. xi, No. 4, 1902.

² *Ann. of Ophthal.*, vol. xi, No. 4, 1902, p. 448.

³ *Arch. f. Augenheilk.*, April, 1903.

⁴ *Brit. Med. Jour.*, June 6, 1903.

⁵ *Ophthal. Rec.*, July, 1902.

⁶ *Brit. Med. Jour.*, May 3, 1902.

case similarly cured. The case of F. L. Henderson¹ is noteworthy for recovery without local interference. The diagnosis was made by microscopic examination of a small section excised. E. Jackson² describes a case of tuberculosis of the conjunctiva in which the ocular condition was preceded by swelling of the cheek and enlargement of the lymphatic glands of the neck and accompanied by vomiting and fever. The lids were studded with granules resembling somewhat miliary tubercles. Examination of the discharge revealed the presence of tubercle bacilli on several occasions. The local treatment was confined to the use of a lotion of trikresol [1 : 1500] and iodoform ointment (25 %). The general treatment included rest, abundant food, outdoor living, cod-liver oil, and tonics. Under treatment the lids became less swollen and the granules decreased in size.

Carcinoma epibulbare planum, an extremely rare new-growth of the conjunctiva, is reported by B. Matys,³ Prague, occurring in a man 78 years of age. The duration of the condition was about 16 months when it came under the writer's observation, and it occupied nearly the entire lower half of the bulbar conjunctiva. The growth was removed and examined microscopically. A diagnosis of carcinoma was made. Recurrence occurred on the sixteenth day after operation.

PTERYGIUM.

Gonin⁴ reports a case in which several relapses of a pterygium resulted in complete veiling of the cornea. He applied the term "malignant" to this condition. Chacon⁵ makes the statement that while pterygium may result from the action of irritants, it is, in Mexico at least, diagnostic evidence of alcoholism. J. O. McReynolds⁶ shows that the cause varies in different countries, and that in his experience it is due largely to the irritation of heat, dust, and high winds. He also states that the operation for the condition must vary according to these several conditions, and describes a modification of Desmarres's operation devised by himself. The details of the operation as given by McReynolds are the following: (1) Grasp completely the neck of the pterygium with strong but narrow fixation forceps. (2) Pass a Graefe knife through the constriction and as close to the globe as possible, and then with the cutting-edge turned toward the cornea shave off every particle of the growth smoothly from the cornea. (3) With the fixation forceps still hold the pterygium, and with slender, straight scissors divide the conjunctiva and subconjunctival tissue along the lower margin of the pterygium, commencing at its neck and extended toward the canthus, a distance of $\frac{1}{4}$ to $\frac{1}{2}$ of an inch. (4) Still hold the pterygium with the forceps, and separate the body of the growth from the sclera with any small, noncutting instrument. (5) Now separate well from the sclera the conjunctiva lying below the oblique incision made with the scissors. (6) Take black silk thread armed at

¹ Ann. of Ophthalm., July, 1903.

² Ophthalm. Rec., Oct., 1903.

³ Jour. Am. Med. Assoc., April 25, 1903.

⁴ Ann. d'Oculistique, Nov., 1902.

⁵ Anales de Ophtal., Sept., 1902.

⁶ Jour. Am. Med. Assoc., Aug. 9, 1902.

each end with small curved needles and carry both of these needles through the apex of the pterygium from without inward and separate from each other by a sufficient amount of the growth to secure a firm hold. (7) Then carry these needles downward beneath the loosened conjunctiva lying below the oblique incision made by the scissors. The needles, after passing in parallel directions beneath the loosened lower segment of the conjunctiva until they reach the region of the lower fornix, should then emerge from beneath the conjunctiva at a distance of about $\frac{1}{4}$ to $\frac{1}{2}$ of an inch from each other. (8) Now with the forceps lift up the loosened lower segment of conjunctiva and gently exert traction upon the free ends of the threads, which have emerged from below, and the pterygium will glide beneath the loosened lower segment of the conjunctiva, and the threads may then be tightened and tied and the surplus portions of thread cut off, leaving enough to facilitate the removal of the threads after proper union has occurred. It is very important that no incision should be made along the upper border of the pterygium, because it would gape and leave a denuded space when downward traction is made upon the pterygium.

BACTERIOLOGY.

In a series of experiments performed for the purpose of determining the role of the toxins of various bacteria in inflammations of the eye, R. L. Randolph¹ has demonstrated the importance of these toxins in explaining the pathogenic action of bacteria in ocular conditions. In these investigations the toxins of the gonococcus, the diphtheria bacillus, the pneumococcus, *Staphylococcus aureus*, *Micrococcus epidermidis albus*, *Streptococcus pyogenes*, *Bacillus coli communis*, and *Bacillus xerosis* were employed. The first 40 experiments consisted in the instillation of the toxins into the conjunctival sac. In 39 of these the results were uniformly negative. In one case conjunctivitis was produced, but this was directly traced to a solution in the continuity of the mucous membrane. Then 31 experiments were performed in which the toxins were injected into the conjunctiva, and conjunctivitis was produced in every case. Seven experiments were made consisting in the injection of the toxins into the anterior chamber. Iritis was produced in all of these cases, but not panophthalmitis, owing, as the observer states, to the oozing of the toxin through the corneal wound and its dilution by the regenerated aqueous. In another extensive series of examinations Randolph has determined the character of the bacteria normally present in the rabbit's conjunctiva. A knowledge of this is very important, as practically all the experimental work of the ophthalmologist is performed on the rabbit's eye. His experiments extended over 47 cases. *Staphylococcus albus* was found in abundance in 36 cases. In 10 cases an assortment of miscellaneous bacteria was encountered, and in but one instance was a sterile plate made. Randolph in his excellent work has demonstrated beyond a doubt that the formula necessary for certain ocular

¹ Am. Jour. Med. Sci., Nov., 1902.

inflammatory conditions is toxins plus a lesion of the conjunctiva. He has also shown that it is the toxins and not the irritation induced by the presence of the bacteria alone that give rise to the inflammation, and that toxins are produced in the conjunctival sac by bacteria ordinarily devoid of such constituents.

PROPHYLAXIS OF CONTAGIOUS DISEASES.

That the results attending prophylaxis in ophthalmology are becoming more manifest each year is readily shown by recent statistics taken from all parts of the world. Following the passage of a law in 1886 in New York State requiring isolation of contagious eye-diseases, the percentage of such affections has been rapidly decreasing. A brief review of Derby's statistics¹ in this connection will serve to verify this statement. In 1886 the inmates of 51 institutions, numbering 12,684 in all, were examined; and of these, 3862 were declared to have contagious ophthalmia. In the New York Juvenile Asylum in 1886 the percentage of such cases was 17.7, but in 1902 was only 2.5. In 1886 the Five Points House of Industry showed 66.5 % of contagious ophthalmia; in 1902 it showed only 4.4 %. In the Catholic Protectory in 1886 there was 40 % of the inmates with contagious eye-diseases, but in 1902 there was but 3.7 % of such cases. In 1886 the House of Our Lady of the Rosary showed 18.3 % of contagious ophthalmia; in 1902 only 1.6 %. In the House of Refuge in 1886, 16.2 % of the inmates were afflicted with contagious eye-disease, but in 1902 only 7 % could be demonstrated. In St. Joseph's Asylum in 1886 Roosa found 58.34 % of trachoma; the examination in 1902 showed only 1.2 % of such cases. Statistics show that about 19 % of the candidates applying for admission to these institutions have trachoma; most of them have attended public schools and further aided in the dissemination of the disease. Inspection ordered by the Board of Health in two New York schools showed respectively 19.2 % and 15.5 % of trachoma cases. Derby recommends the examination of the eyelids of school-children at regular intervals and the application to day-schools of the methods efficacious in institutions where children are permanently lodged. W. E. Lambert² verifies Derby's statistics in his report of the New York Public Schools. Thirty-six public schools were inspected, resulting as follows: Of 57,450 children examined, 6690 were found to have some form of contagious eye-disease—over 13 %. Of these, 2328 were severe trachoma, 3243 were mild trachoma, and 1099 acute purulent conjunctivitis. The percentage in the different schools varied from 3.2 to 22.2, the boys showing a larger percentage than the girls: boys, 3.6 to 28 %; girls, 1 to 18 %. Lambert and Derby urge the eversion of the lids in examining children or others to determine the presence of the granulations which would otherwise escape notice. The reduction in trachoma cases in this country is due not only to the exclusion of infected immigrants, but to prompt recognition and modern treatment. In support of the latter statement the statistics of Myles Standish³ may be

¹ Med. Rec., July 5, 1902.

² Med. Rec., Feb. 21, 1903.

³ Boston M. and S. Jour., Oct., 1902.

quoted: The proportion of cases coming to the Out-Patients' Department of the Massachusetts Eye and Ear Infirmary suffering from trachoma was as follows: In 1880, 3.5 %; in 1881, 3.6 %; in 1882, 4.1 %; in 1883, 3.7 %; in 1884, 3 %—an average of 3.5 % for the 5 years. Comparing this with the last 5 years, we find there were in 1897, 1.3 %; in 1898, 1.4 %; in 1899, 1.2 %; in 1900, 1.1 %; and in 1901, 1 %; being an average in the 5 years of 1.2 %. Again in the years 1880–1884 the total number of in-patients in the infirmary was 2611; of these, 329 were trachomatous, or 12.6 %, while during the last 5 years the total number of in-patients was 4905, of whom 148 were trachomatous, which gives us 3 %. A. E. Davis¹ contributes some interesting data as to the influence of the Immigrant Act of 1897. In 1891 this observer collected reports of over a half million cases of ocular diseases in the large cities, of which 4.25 % were trachoma cases. In 1901, three years after the law of exclusion of trachoma cases went into effect, out of 90,640 cases of eye-disease only 2460 cases, or 2.71 %, were trachoma, showing a decrease of almost one-half. Bailey,² in an examination into the causes of blindness in Kentucky, states that trachoma was responsible for the loss of sight in 14.5 % of the inmates of the Kentucky Institution for the Education of the Blind.

Turning to the work of foreign observers, it is interesting first to note the conditions in Egypt. At the first Egyptian Medical Congress at Cairo, December 19, 20, 1902, Eloui Bey, of Cairo, stated that in the governmental schools 32 %, in the national schools 65 %, and in the kouttabs 75 % of the students were affected with trachoma. In 1884 he showed that 85 % of the students in the government schools had the disease. Morax and Lakah³ state that the average number of cases of granular ophthalmia among the children in several native Egyptian schools which they examined was 93 %. According to these observers, this state of affairs is largely due to the employment of wet-nurses, 20 % of whom are afflicted with the disease. Although the conditions in Egypt are yet deplorable, a gradual improvement has been noted. Volney, who traveled in Egypt in 1784, said that for every 100 persons he met on the streets of Cairo 20 were blind, 10 were one-eyed, and 20 others had their eyes red, purulent, or spotted with leukoma. MacGregor in 1804 speaks of 2000 English soldiers who returned to England blind from Egyptian ophthalmia. Of the Continental observers, Straub reports that the percentage of trachoma in the schools of Amsterdam was reduced from 76 to 14 in 1897.

THE VISION OF TRANSPORTATION EMPLOYEES.

After a somewhat brief intermission, the subject of the relation of color-blindness to railroad transportation is again brought to the attention of the medical public with renewed vigor. J. T. Barnes,⁴ in an endeavor to collect statistics bearing upon this subject, addressed a

¹ The Post-Graduate, May, 1902.

² Ann. d'Oculistique, Nov., 1901.

³ Am. Pract. and News, March, 1903.

⁴ N. Y. Med. Jour., March 14, 1903.

circular letter to fifty of the leading railroads of the United States, containing questions as regards the character, frequency, records, and results of examinations of hearing and sight. Of the 50 companies addressed, only 32 replied in full; of these, 21 stated that they retained a medical expert (ophthalmologist) for their examinations, while the remaining third resort to officials of their own lay bodies. It is inferred that corporations not replying do not resort to a medical referee. A curious fact is that most of the companies that do not retain a consulting medical expert referee are among the older and eastern companies (with one very noteworthy exception), while those that do rely upon such referee are commonly western, newer, and progressive companies. Barnes also states that in only 3 States of the United States (Ohio, Massachusetts, and Alabama) is an examination of sight and hearing in transportation company employees required by law, and suggests that such examinations, by experts, should be required in all of the States. The necessity of this is more forcibly impressed upon the mind by a glance at the report of the United States Interstate Commission for the year ended June 30, 1900. The total number of railroad casualties was 58,185, the aggregate number of persons killed being 7865, and the number of injured 50,320; of railway employees, 2550 were killed and 39,643 were injured. The figures show that 1 out of every 399 employees was killed, and one out of every 26 was injured. With reference to men actually engaged in the running of trains, one was killed out of every 137 employed and one was injured out of every 11. The summary shows that in the course of 13 years ended June 30, 1900, in consequence of railway accidents, 86,277 persons were killed and 469,027 injured in the United States.

Hugh L. Murray,¹ after 4½ years' service as examiner of the Victorian Railway Employees, reports having examined 7500 men. Of these, 4200 were in the service and 3300 were candidates applying for admission. Of the 4200 men in the service, the results were approximately as follows: passed, about 85 %; failed, about 9 %; referred for treatment to be kept under observation and reexamined, about 6 %. Of those who failed, the causes were: defective vision, about 80 %; defective hearing, about 16 %; and defective color-sense, about 4 %. The visual defects were due to: refractive errors, about 60 %; cataracts, about 5 %; squint, about 3 %; injury, about 30 %; the other causes, including diseased lids, optic atrophy, etc., 2 %. The color defects were usually the red-green blind variety. Complete color-blindness or monocular color-blindness was not encountered, neither was any color-defect found in any of the females examined. This observer states that the standard for vision should be modified according to the character of the work, and suggests the following standards in use by him in examinations for railway service: CLASS A.—All men who are or may be concerned in the actual running of trains, viz., cleaners, shunters, porters, traffic lads connected with the running, junior clerks, and junior operators. Vision must be normal, $\frac{5}{8}$. Refraction must be normal, except that latent hypermetropia up to 0.75 D. will not disqualify. In compound hypermetropic astigmatism

¹ Intercol. Med. Jour. of Australasia, Oct. 20, 1902.

the sum of correcting glasses must not exceed 0.75 D., of which 0.50 astigmatism only will be allowed. CLASS B.—Men concerned with moving traffic to a less responsible extent, viz., repairers, ordinary laborers (all branches), telegraph linemen, masons, carpenters, and painters, all trades, and apprentices. Vision must be normal, $\frac{5}{8}$ in each eye; $\frac{5}{8}$ in each eye will not disqualify, provided it is not accompanied by latent hypermetropia or evidence of progressive disease. Refraction must be normal in each eye, but latent hypermetropia up to 1.25 D. will not disqualify. In compound hypermetropic astigmatism, the sum of the correcting glasses must not exceed 1.25 D., of which not more than 0.75 astigmatism will be allowed. CLASS C.—Engineering students and draftsmen. Vision must be normal, $\frac{5}{8}$, with or without glasses. Refraction, myopia beyond 3 D. will disqualify.

T. H. Bickerton,¹ of Liverpool, has also considered this subject at length as regards the **mercantile marine**, and urges the necessity of expert examinations on account of the increased rate of speed recently acquired by vessels. He has compiled tables from his own examinations, extending over many years, which serve to emphasize this need.

Returning to the work of American ophthalmologists, one of the most valuable reports is that of G. D. Murray,² Scranton, Pa., who personally examined 4608 employees of the D., L. and W. R. R. for acuity of vision, hearing, and color-perception. For convenience in recording he grouped the men in 3 grades. The first was made up of two classes. CLASS A included men with normal color-perception and hearing and whose vision was not less than $\frac{1}{4}\frac{5}{8}$ in one eye and $\frac{1}{4}\frac{5}{8}$ in the other. CLASS B was made up of those whose color-perception was normal, but whose hearing and vision were slightly defective and amenable to treatment. These men were subjected to reexamination. In the second grade were placed all men whose chromatic sense was weak, and whose sight was partially destroyed by traumatism or disease. Those with one eye only and in whom deafness, perceptible in conversation, was progressing were also included. The third grade was made up of men completely color-blind and markedly deaf. The necessity for this grading, Murray points out, lies in the fact that to remove from such a service all those who were unable to attain the ordinary standards (such as suggested by F. Allport³) would severely cripple the road. By this grading it is possible to retain in unimportant positions those partially defective in the special senses. This is but fair to old employees who have been in the service a lifetime, but for new men Allport's standards should be maintained. His examination showed that 3.01 % were color-blind, 2.58 % had weak chromatic sense, and 9.44 % were in need of glasses or other means to improve their vision for distance. He suggests that the use of tobacco be discouraged; that annual examinations should be made; and that railroad employees should have the equivalent of 8 hours' sleep daily.

Pourquié,⁴ of Torreon, Mexico, in a report of the examination of vision in the employees of the Mexican International Railroad, adds

¹ Practitioner, Feb., 1903.

² Jour. Am. Med. Assoc., Oct. 13, 1900.

³ Ann. of Ophthal., Jan., 1903.

⁴ Ophthal. Rec., Oct., 1903.

some interesting data. The visual acuity, refraction, visual fields, and the fundus were included in the examination. Stilling's tables and Holmgren's wools were used to detect faulty color-perception. The observer states that peripheral color-sense is most important in railway employees. As a result of color-blindness, 2.29 % of the individuals examined by him were rejected. As regards visual errors, those with less than $\frac{1}{4}$ vision were not retained in the service and correcting lenses were allowed only to old employees. Of the 2400 examined, 130 were rejected on account of visual defects, 31 of whom possessed only one eye.

In nearly all of these examinations, both in this country and abroad, the **Holmgren test** or some adaptation of it was used; the person under examination being directed to match the colors. This procedure is diametrically opposed to the method advocated by Edridge-Green,¹ who states that no test in which the color names are ignored is efficient. In support of this he shows that the Board of Trade (England) rejected 38 % one year and 42 % another year as color-blind who were found to be normal sighted.

Kenneth Scott² has devised a **new color-test** for the determination of working ability of railroad and marine employees. The ordinary tests frequently disqualify good men by reason of their inability to distinguish tints and shades of the various colors, and Scott's test is intended to overcome this disadvantage. His apparatus consists of a revolving disk containing 5 round apertures, each 10 mm. to 15 mm. in diameter. One of these openings is unoccupied; the remaining contain red, green, violet (or purple), and plain frosted glass, respectively. The disk is fastened to the chimney of an argand gas lamp and the illumination is modified by an iris diaphragm. A separate piece of frosted glass is mounted on an arm so that it may be placed in front of the colored glass during the test and alter its tint. The colors used are those employed by the transportation companies, while the artificial light and the ground glass are intended to modify these colors as they are modified in actual work.

P. Fridenberg³ describes a new method for the **detection of central color-perception** in which the test-objects are about 4 mm. square and cut out of variously colored paper or cardboard. The patient should stand opposite the examiner so that his line of vision meets that of the examiner and the test object is brought to a point at which it is fixed by both the subject and the examiner. The targets are held in the left hand, hidden from the patient's view. One of the squares is picked up by a small forceps held between the thumb and third finger of the right hand, the index-finger of which is extended over the square so as to cover it when the hand is held up before the patient. When fixation is absolute, the index-finger is flexed and the square exposed momentarily. The same principle is used in an instrument devised by this observer for the detection of color scotomas. It consists of a color carrier, not unlike an ophthalmoscope in appearance, the lenses being replaced by the color squares. The front of the instrument which is presented to the patient

¹ Brit. Med. Jour., Nov. 22, 1902, p. 1651.

² Med. Press and Circ., Dec. 17, 1902.

³ Arch. Ophthal., May, 1903.

has an aperture 8 mm. in diameter which can be reduced by a sliding quadrant 1, 2, 3, and 4 mm. in diameter. The aperture is covered by a shutter moving vertically on a spring slide. The fixation point is marked by a white dot. The color disks are exposed by drawing down the slide, the release of which causes the aperture to be closed.

CORNEA.

Kopff¹ records 2 cases of **keratoconus following traumatism**, in one of which the condition was bilateral. He believes that injury should therefore always be considered as a possible cause for keratoconus. Meding² describes a case in which 8 **chestnut-bur thorns** transfixed the cornea as the result of a bur falling upon the eye. It was impossible to remove the thorns and atropin was instilled. Three of the thorns were removed one month later, two more in another month, and the remainder disappeared a few weeks afterward by absorption. The lessons drawn from this interesting case were: (1) The thorns were aseptic; (2) the curious tolerance of the cornea and absorptive powers of the aqueous, not generally believed to include vegetable matter; (3) the wisdom of retaining the thorns as plugs for the wounds they made, thus preventing infection; (4) the largest and most opaque scar was left at the site of the preliminary efforts at removal.

F. Buller³ reports a case of **acute suppuration of the cornea** successfully treated after ligation of the canaliculi, showing the influence of the tear-ducts in such affections. During the treatment for **corneal fistula** there is always more or less danger of injury to the lens, and in order to obviate this, J. M. Ball⁴ recommends introducing a keratome into the anterior chamber as in iridectomy. The tip of the instrument passes beyond the fistulous area and is held *in situ* while a cautery is used to destroy the walls of the fistula. Atropin is instilled and a compress bandage is applied. **Detachment of corneal epithelium**, according to Menzies,⁵ may occur with or without vesicle formation. In the majority of these cases a history of injury is obtainable; the detached epithelium does not become firmly reattached and is disturbed by movements of the lids, causing great pain. If the case extends, an ulcer may result. The diagnosis depends upon the history and careful inspection of the cornea under proper illumination. In some cases fluorescein may be useful. The treatment consists in tying up an injured eye until corneal healing is complete. In mild cases massage with an ointment or oily substance is generally sufficient. When there is a distinct blister, the detached epithelium should be removed, the denuded surface scraped, an ointment applied, and the eye bandaged.

The endothelium of the cornea has been recently shown to contribute largely to the pathology of the cornea, according to the investigations of Graflin.⁶ As examples of the conditions in which it takes part may be

¹ Rev. gén. d'Ophthal., Sept. 30, 1902.

² Montreal Med. Jour., March, 1902.

³ Brit. Med. Jour., Nov. 1, 1902.

⁴ Arch. of Ophthal., Nov., 1902.

⁵ Med. Rec., May 7, 1903.

⁶ Zeit. f. Augenheilk., May, 1903.

mentioned parenchymatous keratitis, clouding of the cornea after secondary glaucoma, iritis, and iridocyclitis. As diseased conditions of the corneal endothelium are factors in the production of these affections, it necessarily follows that any treatment, to be successful, must be directed toward the regeneration of the endothelium. The specific influence of Fowler's solution is thus explained.

Corneal ulceration and its treatment are still the subjects of considerable discussion. Roemer¹ confirms the observations of Uthoff and Axenfeld in regard to the finding of pneumococci in 95 % of cases of serpent ulcer. In 8 beginning ulcers cure was effected by the **pneumococcus serum**. **Exclusion of the actinic rays of light** has also been shown to have a beneficial influence upon corneal ulcers by M. Lowe,² in the report of one of his cases. Red tissue paper was used to modify the light, and soon after the pain, photophobia, injection, lacrimation, etc., promptly disappeared. On the third day the patient was comfortable and was able to sew and read. The local use of iodine in the treatment of corneal ulcers has been greatly exploited by J. L. Hiers.³ Duane⁴ recommends **iodine-vasogen**, a solution of iodine in vasogen, and after a thorough trial reaches the following conclusions: (1) Iodine-vasogen is a valuable application in infiltrated and spreading ulcers of the cornea, whether associated with purulent conjunctival secretion or not. It is particularly indicated in those cases in which the galvanocautery is contraindicated by the situation of the infiltrate. (2) It rarely causes pain, if not applied to excess, and never causes any unpleasant reaction or untoward effects. (3) Preliminary anesthetization of the cornea with cocaine is rarely required and in general is better omitted. (4) The application is best made every other day until the infiltrate begins to shrink decidedly, and then should be made every 3 or 4 days until the infiltrate disappears. Katz⁵ recommends the employment of eserine in cases of peripheral ulceration of the cornea, scrofulous keratitis, etc. He uses a pomade composed of eserine sulfate, 0.03; iodine, 0.12; and vaseline, 6.0. Fedorow⁶ used an ointment of ichthyol, 0.1; cocaine hydrochlorate, 0.15; and vaseline, 5.0, in 28 cases of corneal infiltration, and is of the opinion that resorption was hastened and reestablishment of corneal transparency favored by the applications. J. F. Klinedinst⁷ employs **acetozone** in the strength of 1 grain to 2 fluidounces of water in all infected wounds of the cornea, and states that it is very efficient in controlling bacterial ocular infections.

Tumors of the cornea are of extremely rare occurrence. Semple, Carcassone, and Villard,⁸ in a biographic study of primary sarcoma of the cornea, include a case observed by them in a man 68 years of age. The condition was of 15 years' duration and resembled pannus crassus. Enucleation was performed and diagnosis confirmed by the microscope.

¹ Zeit. f. Augenheilk., Sept., 1902, p. 365.

² Intercol. Med. Jour. of Australasia, March 20, 1903.

³ Phila. Med. Jour., Nov. 29, 1902.

⁴ Arch. of Ophthal., Sept., 1902.

⁵ Westnik Ophthalmol., 1902, No. 3.

⁶ Westnik Ophthalmol., 1902, No. 3.

⁷ Jour. of Eye, Ear, and Throat Dis., vii, No. 6, p. 139, 1902.

⁸ Ann. d'Oculistique, April, 1903.

IRIS AND CHOROID.

W. C. Posey¹ gives the history of 2 cases of **congenital defect of the iris and choroid** in which the anomalous condition was transmitted from mother to daughter, as shown by the accompanying illustrations (Figs. 108 and 109).

Iritis as a complication of mumps has been recorded by A. Collomb² and Pechin.³ In Collomb's case the affection was unilateral and disap-

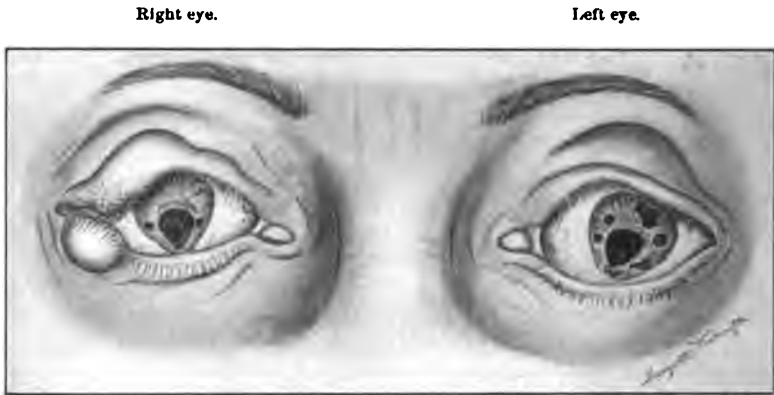


Fig. 108.—Changes in mother's eyes (W. C. Posey, in *Ann. of Ophthalm.*, Jan., 1903).

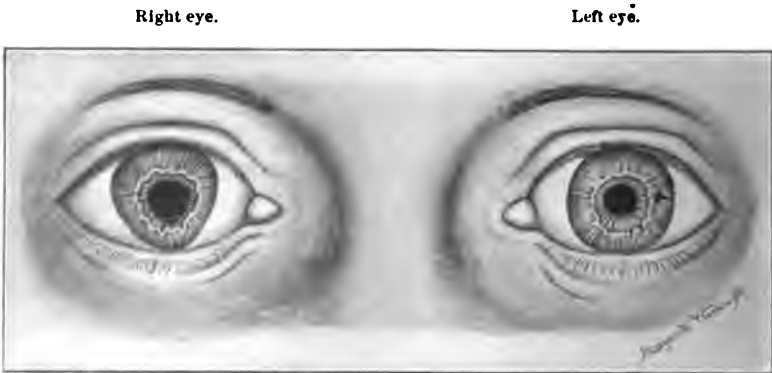


Fig. 109.—Changes in daughter's eyes (W. C. Posey, in *Ann. of Ophthalm.*, Jan., 1903).

peared rapidly under treatment. In Pechin's patient the iritis was bilateral and was accompanied by unilateral keratitis. Both cases were subacute and attended by very little pain. H. Friedenwald⁴ describes 2 cases of **tuberculosis of the iris** in which the miliary tubercles were distinctly grayish and pearl-like in appearance and did not possess the

¹ *Ann. of Ophthalm.*, Jan., 1903.

² *Rec. d'Ophthal.*, June, 1901.

³ *Rev. Méd. de la Suisse Rom.*, Jan. 20, 1903.

⁴ *Amer. Med.*, July 5, 1902.

usual yellow or reddish color. The deposits on the inner surface of the cornea differed from those ordinarily found in plastic or serous iritis. Besides the fine deposits, there were a few very large, white, sharply circumscribed deposits in both eyes, between 1 mm. and 1.5 mm. in diameter. They were not round, but irregular in form, and had the appearance of the tubercles in the iris.

C. S. Bull¹ describes 5 cases of iridochoroiditis directly traceable to gonorrheal infection. In reviewing these cases he states that inflammations of this character never follow urethritis immediately, but are invariably preceded by arthritis. The symptoms are more severe than those of rheumatic character and always suggest an unfavorable prognosis, but with persistent treatment the inflammation rapidly subsides without leaving any marked impairment of vision.

Casey Wood and Brown Pusey,² in a detailed review of 87 cases of primary sarcoma of the iris, bring forward the following prominent features of these growths: Histologically, these growths consist of small round and small spindle cells. There were no degenerative changes and very little inflammatory reaction. Pigment was present. In most cases the cells originated from mesoblastic tissue; in 11 cases the growth proceeded from congenital nevi and 3 showed an arrangement of cells around the bloodvessels resembling periendothelioma. As to age, 27 cases were observed under and 57 after 30 years of age; 36 were in females and 45 in males. In 33 cases the right eye was involved and in 28 the left eye. The lower half of the iris was the primary site in 33; the upper half in 13; nasal 5; temporal 2. Enucleation was performed in 57 cases, 41 of which showed extension of the growth beyond the iris. Iridectomy was performed 27 times: in 3 cases the results were bad; in 5 cases there was no recurrence in 3 years. In one case there was no return; the eyeball was enucleated 11 years afterward for another condition. Sixteen years after the iridectomy the patient died of generalized sarcoma. The most important conclusion reached by these observers is that when a diagnosis of sarcoma of the iris is established, the globe containing the growth should be immediately enucleated because of the impossibility of determining the limitations of the growth by clinical methods.

W. H. H. Jessop³ records 2 cases of tuberculosis of the choroid of unusual interest. In the first case, a girl of 9 years, a growth of the conjunctiva was also present, and there were 2 areas of retinal detachment corresponding with 2 masses obscuring the disk. Three months later these masses disappeared, leaving patches resembling albuminuric retinitis. Vision was $\frac{6}{18}$. The second patient, a woman 23 years of age, had similar masses in the choroid which disappeared in 3 or 4 months leaving behind no traces. The diagnosis in both cases was confirmed by inoculation experiments.

E. L. Oatman⁴ reports a case and reviews the literature of metastatic carcinoma of the choroid. He has collected 30 cases in which 20 of the primary growths were situated in the breast, 3 in the lungs, 2 in

¹ Med. Rec., Dec. 20, 1902.

² Brit. Med. Jour., May 23, 1903.

³ Arch. of Ophthal., July, 1902.

⁴ Amer. Jour. Med. Sci., March, 1903.

the liver, 1 in the stomach and liver, 1 in the thyroid, 1 in a dermoid cyst of the suprarenal body, and 3 were not located. The average age was 44.37 years. The females were affected in the proportion of 3 cases to 1 in the male on account of the preponderance of breast carcinoma in the female. In 20 cases the right eye was involved and both eyes were affected in 10 cases. The deposit always occurs posteriorly, near the point where a short ciliary artery enters the globe, and appears in the corresponding region of the second eye when the latter is attacked, indicating that the second eye is not invaded by way of the lymph-channels of the optic nerve and chiasm. The typical shape is a flat discoid thickening of the choroid with a central elevation, sloping off to the periphery. The eye-symptoms rapidly progress until there is destruction of vision in 2 to 8 weeks, due to the early and extensive retinal detachment. The tension is increased in about one-third of the cases and diminished or normal in over two-thirds. The average duration of life after eye-symptoms appear is $6\frac{1}{2}$ months. Oatman gives in parallel columns the distinctive points between sarcoma and carcinoma. The condition is hopeless. He does not advise operative interference, as it may hasten the death.

Secretion of the Aqueous.—Hainburger¹ believes that Leber's views as to the secretion of the aqueous are erroneous, and that instead it proceeds from the anterior border of the iris, as demonstrated by experiments with fluorescein.

The **origin of the vitreous** in vertebrates has been made a subject of special study by Tornatola,² Messina, who states: that the normal vitreous is composed of fibrillas devoid of granulations; that there are no pseudocells at the points of intersection of the fibrillas; that the rosary arrangement of the fibers is not normal, but pathologic; that there is no hyaloid membrane; that there is no true internal limiting membrane of the retina; that the vitreous arises from cells without nuclei which form the base of the pars ciliaris retinae and from the elements which in the differentiated retina constitute the neuroglia.

LENS.

L. Verderau³ describes a series of experiments upon rabbits, consisting in the **artificial production of cataract** by traumatism; and the subsequent treatment by injection of a few drops of a 5 % solution of potassium iodid into the crystalline lens, and also by subconjunctival injections of the same solution. While the success of this method of treatment lacks clinical confirmation, the results obtained in animals were sufficiently favorable to suggest the possibility of its future therapeutic value in man. Under the influence of these injections the opacities diminished and in many instances disappeared entirely. The author draws the following conclusions from his work: (1) Potassium iodid has a marked effect upon opacities of the crystalline lens, in that it stays their progress. (2) It

¹ Zeit. f. Augenheilk., Sept., 1902.

² Rev. gén. d'Ophtal., March 31, 1903.

³ Rev. de ciencias med. de Barcelona, Jan., 1903.

also promotes retrogression of traumatic lenticular cataract. (3) Its influence is very slight in traumatic opacities of the capsule.

Medical treatment for the cure of cataract has been the vain hope of the medical profession for ages, and this is fostered by the frequent reports of cases of **lenticular opacities disappearing spontaneously**. W. L. Pyle¹ has collected a number of these cases, and concludes as follows: (1) There is no question as to the authenticity of many reports of the spontaneous disappearance of senile cataract, and these cases may be explained and classified in 5 groups as follows: (a) Cases in which there was absorption after spontaneous rupture of the anterior or posterior capsule; (b) cases in which there was spontaneous dislocation of the cataractous lens; (c) cases in which there was intracapsular resorption of the opaque cortex and sinking of the nucleus below the axis of vision after degenerative changes in Morgagnian cataract, without rupture of the capsule or dislocation of the lens; (d) cases in which there was complete spontaneous resorption of both nucleus and cortex without reported history of ruptured capsule, dislocation or degenerative changes of the Morgagnian type; (e) cases of spontaneous disappearance of incipient cataract without degenerative changes or marked difference in the refraction. (2) It is not uncommon for opacities of the crystalline lens or its capsule, the result of traumatism, to disappear, even when the capsule has been penetrated. (3) Too much stress cannot be laid on the value of personal hygiene, treatment of associate local and general disorders, careful and repeated refraction, and the proper use of the eyes in arresting the progress of incipient cataract. (4) In certain complicated cases, secondary to grave nutritional disturbances, lenticular opacities may entirely disappear under appropriate treatment. (5) Generally speaking, the so-called "nonoperative" treatment of cataract as practised by advertising charlatans and irregular physicians is worthless, often distinctly dangerous, and consists in no beneficent measures not known and appropriately used by all reputable oculists.

Unusual Causes of Cataract.—Lecenius² reports the case of a druggist who noticed rapid failure of vision after the **ingestion of naphthalin** and castor oil for the relief of enteritis. There was a diffuse opacity of the perinuclear region of the crystalline lens with a number of small white spots. The patient had always possessed good vision, but was now able only to count fingers at 1.5 meters. Ophthalmoscopic examination was unsatisfactory. The visual fields were much contracted, although there was retained normal color-perception at the last observation. General health was recovered, and the urine contained neither albumin nor sugar, but the cataract remained. **Concussion** has also been shown to be a cause of cataract by J. W. Barrett³ in the report of a case in which punctate opacities were seen in the lens one month after being rendered unconscious in an acetylene-gas explosion. Of equal interest is the great percentage of hard cataract that occurs in **bottle-finishers**

¹ Jour. Am. Med. Assoc., Oct. 18, 1902.

² Westnik Ophthal., 1902, No. 2.

³ Intercol. Med. Jour. of Australasia, July 20, 1902.

in England. Wm. Robinson¹ states that 18 out of every 75 cases of hard cataract observed by him were in bottle-finishers, and inasmuch as there are only 200 or 300 bottle-finishers in a population of nearly 1,250,000 people in his particular county, he logically concludes that this occupation is an extremely potent etiologic factor in cataract. In a report of 8 cases of cataract occurring in women the subject of goiter, Becker² asserts that in his opinion cataract in these cases is due to autointoxication analogous to the condition that induces lenticular changes in affections of the thyroid gland, Graves's disease, myxedema, etc. T. R. Pooley³ reports 2 cases attended by **unusual complications after extraction** of a cataractous lens. In one, a diabetic patient, death occurred at the end of 7 days, and the other was followed by delirium tremens on the third day after the operation. G. F. Keiper,⁴ in an attempt to determine the opinion of American ophthalmologists as to the **best time to operate on mature senile cataract** when vision is preserved in the other eye, addressed the following questions to 119 members of the Ophthalmologic Section of the American Medical Association: (1) As to the advisability of removing a mature senile cataract if the lens of the fellow-eye is clear or if opaque with useful vision. (2) Whether any complaint of difference in the refraction of the two eyes was made by the patient after operation. To the first question, 16 failed to reply. Of the remaining 103 questioned, 44 were in favor of extraction, 36 were of the opposite opinion, and 23 were noncommittal, allowing other circumstances to influence the treatment. To the second question, 30 made no reply, 27 replied in the affirmative, 55 in the negative, and 7 made vague answers. He urged the removal of the ripe senile cataract, irrespective of the condition of the other eye, claiming the following advantages: larger visual fields, avoidance of dangers incident to the extraction of a hypermature cataract, continuous vision, more comfort from binocular vision, and better cosmetic effect.

F. M. Wilson and H. S. Miles⁵ recommend the **conjunctival flap in the extraction operation** for cataract because it exerts a very positive and easily demonstrated influence in preventing reopening of the wound. The chief disadvantages are the ensuing hemorrhage and the increasing difficulty in performing iridectomy, and in removing loose masses of cortical matter after extraction of the cataract proper.

H. O. Reik⁶ advocates **intracapsular irrigation** of sterilized saline solution in cataract operations as practised by McKeown, and claims it to be the most satisfactory method of removing cortical matter, blood, and air-bubbles. He states that it is harmless and does not tend to cause prolapse of the vitreous.

¹ Brit. Med. Jour., Jan. 24, 1903.

² Med. Rec., Sept. 13, 1902.

³ Inaug. Diss. Giessen, 1902.

⁴ Ann. of Ophthal., 1902, p. 646.

⁵ Trans. Am. Ophth. Soc., vol. ix, 1902, p. 503.

⁶ Ann. of Ophthal., July, 1903.

RETINA.

Unusual cases of retinitis have been reported during the past year that require mentioning. Gonin¹ describes 15 cases of retinitis pigmentosa with annular scotomas and without true concentric contraction of the visual field. C. Zimmerman² records a case of albuminuric retinitis of syphilitic origin which was cured with almost complete absorption of hemorrhage and restoration of vision by prompt administration of mercury and the iodids. The patient died 8 years later of degeneration of the heart-muscles. Duane³ reports 11 cases of unusual types of retinitis and choroiditis. W. G. M. Byers⁴ observed a **hole in the macular region** the result of injury to the eye by a pebble.

H. C. Haden,⁵ in a paper on **retinal hemorrhages as an aid to the early recognition of general arterial degeneration**, reaches the following conclusions: (1) Retinal hemorrhages, associated with high arterial tension and accompanied by transitory albuminuria, are significant of beginning widespread arterial degeneration. (2) That in those cases of so-called physiologic or transitory albuminuria occurring in active, healthy young business men or students, in those who are working under forced pressure, ophthalmoscopic examination should be made for retinal hemorrhages. (3) When retinal hemorrhages occur without albuminuria, the patient should be kept under observation, the urine to be examined from time to time and the quantity passed noted. Beard,⁶ in speaking of retinal arteriosclerosis, states that true **embolism of the retinal artery** is an exceedingly rare condition, Haab having found only 12 cases diagnosed among 60,000 patients. Of these 12, only 2 were found to be undoubted emboli. A case of spastic ischemia of the retina, occurring in a physician, is mentioned. In connection with thrombosis of the choroid, attention is called to a condition that Beard believes has never before been mentioned. This is a peculiar pigmented spot or scar that always remains at the site of thrombosis. The outline is either round or quite irregularly oval, and the pigment is arranged in whorls, through which the white of the sclera shows. The appearance suggests that of knots in pine boards. Active thrombosis and one or more of these old scars have been seen together in the same eye.

H. Gradle⁷ relates a case of neuroretinitis of nephritic origin in which marked improvement in vision was noted after **decapsulation of both kidneys** after the method of Edebohls. [The ultimate result has not been reported.]

Ocular Signs in Chronic Nephritis.—G. E. de Schweinitz⁸ summarized these ocular lesions as follows: (1) Complete blindness without ophthalmoscopic lesions, or at least without the presence of lesions more or less suggestive of disease of the kidneys, generally called uremic

¹ Ann. d'Oculistique, Aug., 1902.

² Arch. Ophthal., Sept., 1902, vol. xxxi, No. 5.

³ Med. News, March 21, 1903.

⁴ Phila. Med. Jour., Feb. 21, 1903.

⁵ Chicago Med. Rec., Nov., 1902.

⁶ Montreal Med. Jour., July, 1902.

⁷ Chicago Med. Rec., Jan., 1903.

⁸ Amer. Med., Dec., 1902.

amaurosis, and most often seen in acute nephritis, but also in acute exacerbations of chronic renal disease. (2) Various types of retinitis and neuroretinitis to which the descriptive term "albuminuric" is commonly applied, and which are most often seen in association with chronic forms of kidney disease. (3) Alterations in the caliber and relation to the retinal vessels owing to sclerotic changes in their walls, with or without hemorrhages and exudates in the retina, seen in association with those forms of renal disease in which vascular changes are evident elsewhere in the body; also isolated hemorrhages and exudates, without marked vessel-wall changes. (4) Alterations in the uveal tract, particularly in the choroid and iris. (5) Some varieties of cataract. (6) Paresis and



Fig. 110.—Occlusion of the superior temporal artery of the retina (de Schweinitz, in *Phila. Med. Jour.*, March 14, 1903).

paralysis of the ocular muscles, particularly the superior oblique and the external rectus. (7) Recurring subconjunctival hemorrhages.

R. A. Fleming¹ noticed in 12 cases of **fracture of the skull**, all of which were fractures of the base except one, that when the hemorrhage into the subarachnoid space was acute, retinal hemorrhages were almost invariably present, and, further, that when there was a unilateral subarachnoid hemorrhage, the retinal hemorrhages were mostly confined to the affected side. In 3 out of 4 cases of intracerebral hemorrhage from other causes there had been sudden effusion into the subarachnoid space and retinal hemorrhages; in the remaining case the effusion was less acute and there was no retinal hemorrhage.

G. E. de Schweinitz² describes a case of **occlusion of the superior**

¹ Brit. Med. Jour., Feb. 21, 1903.

² Phila. Med. Jour., March 14, 1903.

temporal artery of the retina in a young anemic girl of 15 years. The characteristics of this case are best shown by the accompanying illustrations (Figs. 110, 111, and 112).

Galezowski,¹ Paris, records a case of **subretinal cysticercus** in the region of the macula, the diagnosis of which was made by means of the ophthalmoscope. Guiot,² Paris, describes a similar case. [The rarity of this condition often leads one to doubt the diagnosis in these cases unless confirmed by pathologic examination. In a case observed in the Wills Eye Hospital, Philadelphia, the ophthalmoscopic appearances were not unlike those of glioma, a condition which was suspected by a number of competent observers. A subsequent microscopic examination served to correct this error.]

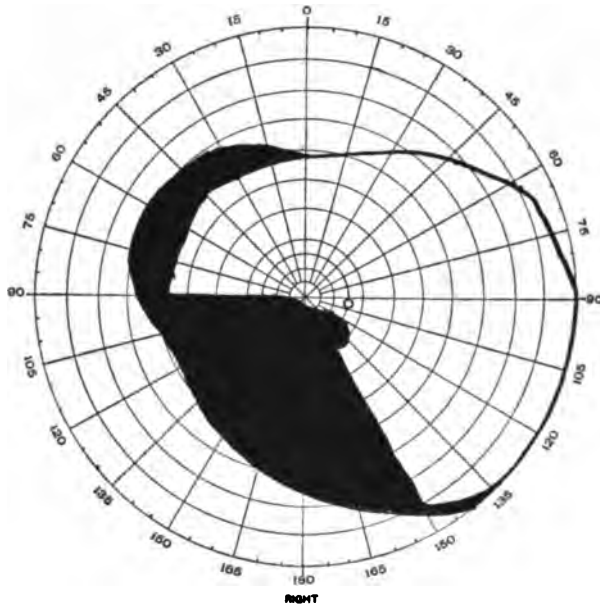


Fig. 111.—Occlusion of the superior temporal artery of the retina. Visual field, obliteration of lower and inner quadrant (de Schweinitz, in Phila. Med. Jour., March 14, 1908).

Retinal detachment has been considered amenable to surgical treatment by L. Mueller,³ Vienna, who proposes resection of the sclera, puncture of the choroid to allow escape of the subretinal fluid, and subsequent suturing of the scleral edge. The operation is preceded by a modified Krönlein operation and the globe is exposed in the equatorial region by temporarily severing the external rectus and inferior oblique muscles.

Glioma during the past year has received considerable attention, particularly as regards its histology. Brown Pusey,⁴ in a study of the genesis of glioma retinae in neuroglia, shows by the staining reaction with Mallory's neuroglia stain that the much discussed "perivascular rosetts" are neuroglial in character. He believes that the wall of the lumen of

¹ Recueil d'Ophtal., April, 1903.

² Münch. med. Woch., 1903, 23.

³ La Clin. Ophtal., April 10, 1903.

⁴ Bull. Johns Hopkins Hosp., Oct., 1902.

the roset corresponds to the internal limiting membrane and not the external; that the radiating fibers which are neuroglia fibers to the fibers of Müller; and the distant nuclei to the neuroglia nuclei normally found in the internal granular layer. The projections into the lumen of the roset are neuroglia fibers which have not found their termination in the walls, and not rods and cones. He advises against the acceptance of the term *neuroepithelioma retinae*. C. R. Holmes,¹ in his report of 5 cases of glioma, contributes some interesting clinical data. Deductions from these carefully taken histories give the following facts regarding 6 eyes affected: CASE 1. Right. Third stage. Optic nerve affected beyond point of section. Recurrence and death. CASE 2. Right.

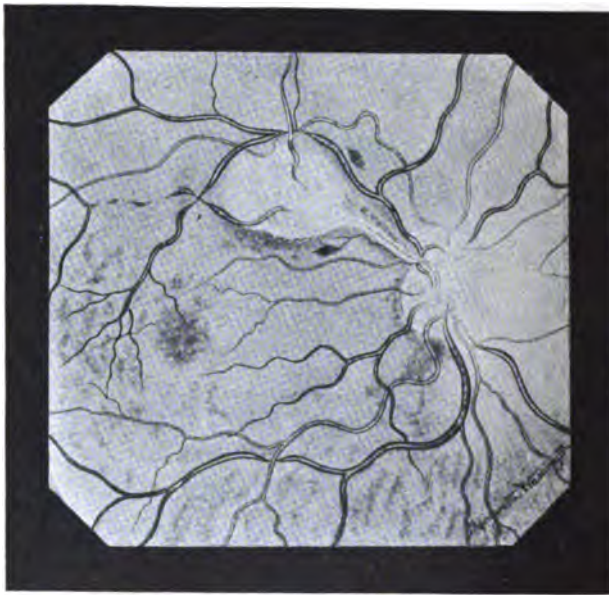


Fig. 112.—Occlusion of the superior temporal artery of the retina (de Schweinitz, in *Phila. Med. Jour.*, March 14, 1903).

Beginning of second stage. Optic nerve normal beyond point of section. Three years and two months since operation. Cured. CASE 3. Left. Beginning of third stage. Optic nerve affected beyond point of section. Recurrence and death. CASE 4. Left. End of first stage. Nine years since operation. Cured. CASE 5. Left. End of first stage. Four years since operation. Cured. CASE 6. Right. End of first stage. Fourteen years since operation. Cured. In 3 cases, or 50 %, operation was performed during the first stage, and all ended in cure; one case with operation in the second stage ended in recovery. Two cases with operation in the third stage were fatal. While the number of cases is very small, yet there can be no doubt that operations during the first stage with

¹ *Jour. Am. Med. Assoc.*, March 28, 1903.

extensive resection of the optic nerve will give us a large percentage of recoveries for the operated side. We must also remember that in a great many of these cases the affection will involve the other eye sooner or later; by early removal of the second eye, however, the patient's life may be saved.

OPTIC NERVE.

Bernheimer,¹ of Innsbruck, has demonstrated, anatomically, by the microscopic examination of 20 sections through the upper half of the chiasm of a child with bilateral microphthalmos, the existence of **uncrossed optic nerve-fibers in man**. This confutes K  lliker's statement that the centripetal fibers arising from the retina in man, dog, cat, and rabbit cross completely.

H. J. Parsons,² in an attempt to trace the **degenerations in the optic nerves and tracts** in 6 monkeys, experimentally wounded the retina by means of a Graefe knife and examined the visual system microscopically 2 to 3 weeks after the injury. Briefly stated, the results were as follows: (1) Perforating wounds were found to heal through the agency of the episcleral tissue, the sclerotic having little or nothing to do with the process. (2) The degenerated fibers in the optic nerve retain in large part the same position along the whole course of the nerve. (3) There are invariably some degenerated fibers in the optic nerve of the opposite side. (4) The fibers from the macular region pass from the temporal sides of the nerve anteriorly toward the center as they pass back (author's statement). (5) In all cases there was degeneration in both optic tracts. (6) The fibers spread out as they pass back into the tracts and are distributed among the fibers of the roots of the third and fourth nerves.

W. G. Spiller³ reports a case in which there was an **entire absence of the visual system**. The patient was a helpless idiot of 22 years, afflicted with paraplegia. Postmortem examination revealed absence of the eyeballs, optic foramina, optic nerves, chiasm, optic tracts, and external geniculate body. The posterior portion of each thalamus was rounded and larger than would be expected.

Optic Neuritis.—C. Bolton⁴ reports 2 cases **following diphtheria** and unaccompanied by any renal condition. Recovery occurred 2 months later. Fage⁵ describes a case **following rubeola** in a child 3 years of age. The termination was more favorable than in the preceding, as optic atrophy took place and absolute blindness supervened. Cabannes⁶ describes the occurrence of unilateral optic neuritis **in the course of herpes zoster ophthalmicus** in one of his cases, and in this instance believed both to be due to the same cause. C. G. Lee⁷ gives an account of 4 interesting cases of **monocular optic neuritis** in which it was im-

¹ Arch. of Ophthal., Sept., 1902.

² Brit. Med. Jour., Nov. 1, 1902.

³ Brain, 1902, p. 631.

⁴ Lancet, Dec. 13, 1902.

⁵ Ann. d'Oculistique, July, 1902.

⁶ Gaz. hebdom. des Sciences m  d. de Bordeaux, April 12, 1903.

⁷ Brit. Med. Jour., Nov. 1, 1902.

possible to attribute the affection to the infectious fevers, constitutional disorders, poisons, or any of the causes usually given. All were preceded by unilateral neuralgic pain in the face and head, and in one case movements of the eyeballs caused pain. This observer believes that these cases could be considered as herpes zoster ophthalmicus deprived of the cutaneous manifestations. J. W. Barrett and W. F. Orr,¹ in an effort to determine whether double optic neuritis may be considered as an entity or as a manifestation of cerebral tumor, followed 8 cases over a rather extended period and observed that no less than 5 of these recovered health; in 2 cases the result as to vision was good; in one it was fair and in 2 it was disastrous. There was a possibility of syphilis in 2 cases. Edward Jackson² reviews several cases, head-conditions, in which the visual fields were peculiarly contracted, and thereby shows that the upper portion of the cerebral cortex has to do with the lower part of the visual fields. In one very interesting case there was a positive history of cortical cerebral injury with trephining, and the fields showed a peculiar sector defect.

C. L. Mix,³ in a detailed paper on hereditary optic atrophy, describes 8 cases of this interesting condition occurring in one family. Four members, all males, of this family were living at the writing and were amaurotic. The history of this disease extends through 6 generations, and in 4 of them cases have appeared. The outset of the affection occurred within the narrow limits of 18 and 25 years for 8 individuals or 22 to 25 for 7 of the 8. In one of these cases the patient became blind at 18 years of age and remained so until 21, at which age his sight returned sufficiently to enable him to read. In another case a condition resembling ataxic paraplegia was present, but in none were there any congenital malformations of the visual apparatus. The males were selected by preference; the females serving only to transmit the disease; only one being affected in this series of cases. Syphilis, tobacco, alcohol, sexual excess, etc., are rejected as etiologic factors by Mix, who regards the conditions as a result of the imperfectly endowed visual apparatus which easily undergoes involution, just as brain does in dementia præcox.

Harman⁴ hesitates to accept the current views of the pathology of optic atrophy in retrobulbar neuritis. He believes them to be based upon an inaccurate appreciation of the ascertained facts of the development of the nervous connections of the eye, and of the theory of the neuron. The retina is known to arise as an outgrowth from the brain. Within this outgrowth nerve-cells give rise to axons which grow centrally to make connections with parts of the brain different from the site of origin of the evagination. Thus the trophic centers of the optic nerve-fibers are the ganglion-cells of the retina from which they are outgrowths. The case is parallel with the relation of a posterior root-ganglion cell to its central axon passing into the cord. Thus degeneration of the optic fibers should be in the vast majority of cases ascending only, and we

¹ Intercol. Med. Jour. of Australasia, July 20, 1902.

² Med. News, Feb. 28, 1903.

³ Chicago Med. Recorder, March 15, 1903.

⁴ Brit. Med. Jour., Nov. 1, 1902.

should look in cases of optic atrophy first to the retina for evidence of damage. He believes a rational classification could be arrived at as follows: (1) Primary damage in disease of the ganglion-cells (*a*) from anemia due to spasm of retinal vessels from drugs, as quinin, reflexly from cold, and to general anemia succeeding severe hemorrhages, febrile diseases, etc.; (*b*) from poisoning of the ganglion-cells by drugs,—tobacco, lead,—a view directly supported in the antidote of tobacco-blindness, strychnin, which it is agreed acts directly upon nerve-cells. In all these cases the changes at the disk are proportionate to the number of cells damaged; in cases of great loss of ganglion-cells it is probable that the rapid destruction and swelling of the myelin sheaths of the degenerating fibers at the lamina cribrosa produce a mechanical choked disk. (2) Cases of damage to the optic nerve by contiguity of diseased structures or in general nerve-changes producing islands of fibroid exaggeration, and followed by obvious atrophy of the disk. Here ascending degeneration should be the earlier result, with a later degeneration of the axon segment next the trophic ganglion-cell from disuse, a process the more easy owing to the special myelin sheathing of the optic nerve-fibers. In reply to the question as to how he could explain by ascending degeneration undoubted optic atrophy following section of the nerve in fracture at the optic foramen, Harman says that in these cases there is nothing to show that the damage was limited to the actual point of injury; exudation was just as certainly to be found within and around the optic sheath even to the disk, which would explain the early onset of atrophy in some cases; further, he allows the possibility of a degeneration of the segment between injury and trophic cell, both from disuse and by reason of the arrangement of the myelin sheaths of the optic fibers.

C. J. Kipp¹ reports an interesting case of **transient unilateral external ophthalmoplegia** which was followed by **optic atrophy** and subsequent blindness. The patient was a woman of 35 and gave a history of 2 miscarriages. The paralysis improved under the administration of potassium iodid.

H. Ashby and S. Stephenson² describe 5 cases in which **acute amaurosis followed infantile convulsions**. In their analysis of these cases they include 2 cases previously reported by Nettleship and 4 by Gay, making 11 in all. Of these, 2 were observed between the ages of 6 weeks and 2 months; 2 between 7 months and 8 months; 4 from 13 to 18 months, and 3 from 2½ to 3 years. In 2 cases the convulsions followed whooping-cough and one occurred after congestion of the lungs. In 8 cases no cause could be assigned. In 1 patient, aged 2 months, the convulsion and stupor lasted for 2 weeks, and some signs of optic atrophy persisted. In 4 cases there was no accompanying paralysis; the remaining 7 were attended by varying degrees of paralysis. Sight was recovered in all but one case. In one case there was temporary aphasia. From these facts the authors conclude: (1) That there is a form of amaurosis which occurs in infants or young children which is postecclampsic, due to anesthesia of the visual centers. (2) That the convulsions, which may be

¹ Amer. Med., April 25, 1903.

² Lancet, May 9, 1903.

due to various causes, are likely to be severe and accompanied by coma. (3) That the amaurosis may be associated with aphasia and paresis of hemiplegic distribution; the hemiplegia may be permanent. (4) That the amaurosis is for the most part transient. It is possible that in some instances there is hemianopia.

H. Woods¹ reports a case of **permanent left hemianopia following puerperal eclampsia** in a woman of 33. He believes that the poisonous substance in the circulation in eclampsia may produce thrombi of the smaller vessels, lead to areas of necrosis, and thus bring about permanent defect. Profound transient blindness is the rule in cases of eclampsia. In such cases there is no organic change, the effects cease with the elimination of the poison, but in a few cases thrombosis destroys a limited area, and if this area happens to be a part of the cerebrum having important function there is irreparable loss of that function, as in the case reported.

GLAUCOMA.

In a recent paper read before the French Ophthalmologic Society, Zimmerman² advanced the theory that **decrease in blood-pressure**, from mental or physical shock, cardiac disease, etc., is a prominent factor in the etiology of glaucoma, and in his explanation he utilizes both the theory of defective excretion and that of excessive secretion. When vascular pressure is lowered, even though intraocular tension is normal, the blood enters the eye only with difficulty, and pulsation of the intraocular arteries is noticed. Diminished intraocular supply causes denutritional changes and edema, with actual increase of intraocular tension. The sclera becomes distended, the intraocular veins are compressed, general edema of the inner tunics results, and the gross changes typical of glaucoma occur. Zimmerman believes that in certain cases in which intraocular tension does not rise above normal, glaucoma may develop from a relatively low vascular pressure, the result of profound and persistent cardiac disturbance. He also says that prodromal glaucomatous attacks do not necessarily indicate ocular disease. The eye may at first be healthy, but the blood-pressure be greatly lowered. True glaucoma does not develop until repeated prodromal phenomena have produced such anatomic changes as cupping of the disk and closure of the filtration angle. The practical application of these observations is that in simple glaucoma the treatment should include, primarily, measures to increase and maintain the proper blood-pressure. In 40 cases of sub-acute glaucoma so treated, Zimmerman had need to resort to iridectomy but once. As to the drugs employed, digitalis was found unsuitable on account of certain mydriatic effects. Strophanthus acting upon the heart-muscle rather than upon the bloodvessels was very satisfactory, administered in doses of 8 minims four times daily. Adonis vernalis was found equally effective. This treatment, of course, is not indicated in secondary glaucoma following disease, injury, or operation, as here intra-

¹ Trans. Am. Ophth. Soc., vol. ix, 1902, p. 659.

² Rev. gén. d'Ophthal., Sept., 1902.

ocular pressure is the primal cause, and the arterial pressure may not be disturbed.

C. S. Bull¹ offers the following brief review of his observations after **iridectomy on 94 eyes**. In 7 cases under observation for a period ranging from 15 months to 11 years, the fields remained as they were at the time of the operation. In 6 of these cases the vision grew slowly worse, and in 1 case the vision was somewhat improved. In 5 cases the vision remained as it was at the time of the operation, or improved, while the fields grew narrower. Age, in itself, did not seem to exercise any definitely bad effects, for some of the satisfactory results occurred in patients past 70 years. The best results as to ultimate vision occurred in the cases in which the central vision was best and the fields were the least encroached upon at the time of operation; or, in other words, as soon as the diagnosis was established. Bull also believes that better results are obtained by simultaneous operation upon both eyes when bilateral affection is undoubtedly present, and in all cases early operations are the most effective.

Andogsky and Selensky,² St. Petersburg, in an endeavor to test the **permeability of scleral scars** after the operation of sclerotomy, injected 5 % solutions of iron citrate and india-ink emulsions into the anterior chamber under pressure. The permeability of these scars was demonstrated, and was also shown to depend greatly upon the age of the scar. When 8 to 14 days old, the passage of pigment was very evident; when 21 to 40 days old, but little pigment was found in the scar and in the subcutaneous tissue; and when 40 to 145 days old, no trace of filtration could be discovered. [These experiments serve to corroborate the well-known clinical fact of the temporary efficiency of sclerotomy.]

Herbert³ recommends the **formation of a subconjunctival fistula** in the treatment of chronic glaucoma, and states that it may be performed by producing a subconjunctival prolapse of the iris or by infolding the conjunctiva. In most of his cases he also performs a slight iridectomy. He claims that the visual results following this operation are much better than those of typical iridectomy. In support of this statement he cites 130 cases.

Abadie⁴ mentions 2 cases of **hemorrhagic glaucoma** directly traceable to the use of large doses of potassium iodid in syphilitic patients. Withdrawal of the drug was followed by amelioration of the symptoms.

H. B. Chandler⁵ believes that iridectomy is productive of no benefit in chronic simple glaucoma, and bases this belief upon 20 years of experience with this class of cases. In doubtful cases he prefers to divide the **anterior ciliary arteries** before they perforate the sclera, as he has observed satisfactory results in every instance after this operation.

Karl Hoor⁶ states that **resection of the cervical sympathetic nerve** for glaucoma is indicated only after iridectomy has been declined,

¹ Trans. Am. Ophth. Soc., vol. ix, 1902, p. 429. ² Arch. of Ophthal., Sept., 1902.

³ Ophth. Soc. of the United Kingdom, June 11, 1903.

⁴ La Clin. Ophthal., Nov. 25, 1902.

⁵ Trans. Am. Ophth. Soc., vol. ix, 1902, p. 4611.

⁶ Arch. f. Augeneheilk., Aug., 1902.

or after iridectomy has failed to relieve the symptoms, or after sclerotomy has proved of no avail. He believes it should be supplemented by another iridectomy. He also states that the operation may be performed without a preliminary iridectomy in glaucoma simplex in which there is much visual disturbance and narrowing of the visual field, and in which iridectomy and sclerotomy are of no avail.

MacCallan¹ reports 5 cases of glaucoma in which the instillation of adrenalin induced an increase in the intraocular tension. W. L. Pyle² gives the history of an interesting case of bilateral acute glaucoma following the instillation of a weak mydriatic (cocain and homatropin solution, gr. v to $\frac{3}{j}$) in the eyes of a woman aged 50 years. A typical acute glaucomatous attack occurred 39 hours later. The condition progressed despite treatment by eserine, massage, salicylates, and mercurial inunctions. Posterior sclerotomy was performed in both eyes. Normal visual acuity was established in 72 hours, and all traces of the disease disappeared in two weeks. With correcting lenses vision in each eye then equaled $\frac{5}{j}$. Of great interest in this connection is the report of Myles Standish³ of the 32 cases of glaucoma reported to the New England Ophthalmological Society since its foundation. Of these, 9 were induced by atropin, 2 by homatropin, 1 by cocain, 1 by atropin and cocain combined, 1 by scopolamin, and 1 by duboisin.

ORBIT.

Lucien Howe,⁴ Buffalo, in describing the more recent methods for studying the connective tissue of the orbit, makes mention of the following points: (1) That after the orbital walls and the orbital contents have been removed the outer shell of bone should be sawed down as far as possible, otherwise the specimen will have to remain unusually long in the decalcifying acid. (2) The specimen should be hardened in Zenker's fluid for 3 or 4 days, after which the excess of mercury is washed out by means of Gram's solution of potassium iodid. (3) For the decalcifying process, the specimen should be washed thoroughly with water, then covered by absorbent cotton which is kept moistened with a 20 % solution of hydrochloric acid. (4) For staining, Unna's orcein stain, Van Gieson's picrofuchsin stain, Mall's differential method, Ribbert's phosphomolybdic-acid hematoxylin, and Mallory's phosphomolybdic-acid anilin-blue may be used, but Howe prefers the following method: After hardening, the specimen is placed in water, then in a 1 % potassium permanganate 1 to 3 minutes, washed in running water, placed in 1.5 % oxalic acid solution 4 to 6 minutes, washed in water, stained in 0.25 % to 1 % aqueous solution of acid fuchsin 1 minute, washed in water, stained in $\frac{1}{4}$ % to 1 % solution of anilin-blue 1 to 3 minutes, washed in water and placed in alcohol xylol-balsam.

Enophthalmos has been observed to follow injury by Kilburn,⁵ who

¹ Lancet, May 16, 1902.

² Ophthal. Rec., May, 1902.

³ Jour. Am. Med. Assoc., June 20, 1903.

Ann. of Ophthal., vol. xi, No. 4, 1902.

⁴ Arch. of Ophthal., July, 1902, vol. 31, No. 4.

reports the condition in a man 53 years of age and believes it to be due to rupture of Ténon's capsule or its thickened bands known as the check ligaments. **Exophthalmos**, while usually bilateral, may be unilateral. Rutten¹ describes a case of unilateral transient exophthalmos in a boy of 14, in whom the Graefe and Stelwag symptoms, diminution in vision, tachycardia, enlargement of the preauricular glands, and goiter, were present. Recovery occurred in 3 weeks under the administration of mercury and potassium iodid.

C. Veasey² reports a case of **endothelioma** of the orbit of 12 years' duration, situated beneath the outer third of the left orbital ridge, in a man of 35. The growth was removed without the aid of an anesthetic and a microscopic examination was made, confirming the diagnosis. Wakabayashi³ gives an account of the occurrence of a **distoma cyst** in the orbit of a girl 3 years old and of the same condition in the left upper lid in a boy aged 13 years. Both were removed and the parasites were detected. De Lapersonne,⁴ Paris, reports a case in which sarcomatous elements were found in an irritable stump one year after excision of the anterior segment of a staphylomatous eye in a child 4 years of age.

INJURIES.

E. A. Shumway⁵ gives an account of a unique case in which a severe burn of the face and eye with subsequent loss of the eye was produced by contact with **amyl nitrite**. The patient was an epileptic, and was seized with a convulsion while handling a bottle containing the drug, which was accidentally thrown into the eye. This case is of decided interest in view of the fact that amyl nitrite is said by several well-known authorities to be devoid of irritating properties. [It is likely that some chemical change had taken place in the drug.]

Sympathetic ophthalmia with complete recovery in both eyes is reported by Vail⁶ as occurring in a boy aged 14 following a penetrating wound of the left eye with hernia of the iris. He believes that the intensity of this affection is less in youths than in adults, and that the conservative method of treatment should be given a fair trial in such cases.

The **giant magnet** is considered favorably by Leartus Connor⁷ in a report of 2 cases in which foreign bodies in the vitreous were removed, saving the eye and maintaining some vision.

Mules's operation is compared with enucleation by N. J. Hepburn,⁸ who concludes that enucleation may be performed for cosmetic purposes, for wounds of the globe of considerable extent, and for intraocular disease with destruction of vision, and absolute glaucoma. It must be performed in cases of sympathetic irritation, absolute glaucoma with much thinning of the ciliary sclerotic, in malignant growths of the eyeball, and destruc-

¹ *La Clin. Ophtal.*, Aug., 1902.

² *Medicine*, Nov., 1902.

³ *Tokio-Iji-Shinsi*, n. 1250.

⁴ *Arch. d'Ophtal.*, April, 1903.

⁵ *Phila. Med. Jour.*, Oct. 11, 1902.

⁶ *Am. Jour. of Ophtal.*, June, 1902

⁷ *Jour. Am. Med. Assoc.*, March 21, 1903.

⁸ *Jour. Am. Med. Assoc.*, Aug. 23, 1902.

tive ophthalmitis. The Mules operation is adapted to cases in which only a cosmetic result is required, when range of motility is desirable, in blind eyes without extensive ciliary involvement, and when it is desirable to prevent shrinkage of the orbital tissues.

Bronner¹ recommends a **modified glass ball for use in Mules's operation**, with a hole in the middle, which is covered in with glass so as to keep out air and water. He operates as follows: A catgut suture is passed through and tied on to each of the tendons of the 4 recti muscles. The eye is then removed. The glass ball is introduced into Ténon's capsule, a thick silk suture is passed through the center with a needle attached to either end. The superior and inferior and also the external and internal recti muscles are then tied together over the ball. Three or four catgut sutures are put through the subconjunctival tissue above, below, and over the ball, and tied together in a vertical line. The needles attached to the end of the silk suture of the glass ball are passed through either side of the subconjunctival tissue. Four sutures are then put through the conjunctiva on either side and over the ball, and united in a horizontal line. The ends of the suture of the glass ball are not covered in by the conjunctiva, but are allowed to hang out at the outer and inner ends of the line of suture. They are then loosely tied together over the sutures so as to keep the glass ball *in situ*. The silk suture is not removed for 5 or 6 weeks, so as to give the parts time to become thoroughly organized and hardened.

Suturing of the tendons after enucleation is performed by a new method by Snell,² who rejects the "pursestring" suture commonly employed. Briefly stated each tendon is separated from its sclerotic attachment and fastened to the conjunctiva, after which the lateral tendons are united to each other, and the vertical tendons are brought together.

Paraffin has been used by Suker, Oatman, and others to form an artificial vitreous after Mules's operation, with varying results, but the record of cases in which embolism of the pulmonary artery with subsequent death and blindness from embolism of the central retinal artery followed its use has prevented its receiving a fair trial. Ramsay,³ in an effort to prevent such disastrous results, proposes injection of the paraffin into the capsule of Ténon after enucleation, and in support of this method produces 22 cases in which the cosmetic value was undoubted.

Penetrating Wounds.—H. Wokenius⁴ introduced iodoform into the **vitreous body** of the human eye in 3 cases without any injurious results, and advises it as a routine procedure in penetrating wounds. He introduces the iodoform through a cannula. The drug requires several weeks for its absorption, but its disinfecting power seems positive.

Bürstenbinder⁵ has published an observation of a penetrating wound of the eyeball by a **grain of lead**, which had remained in the **anterior chamber 8 years** without causing any inflammation. There was a pro-

¹ Brit. Med. Jour., Sept. 26, 1903.

² Lancet, 1903, i, 299.

³ Brit. Med. Jour., Nov. 1, 1902.

⁴ Zeit. f. Augenheilk., Aug., 1902.

⁵ Abstr. Rev. gén. d'Ophtal., Aug. 31, 1902.

lapse of the iris, adherent in the corneal cicatrix, a circumscribed opacity of the lens, and a rupture of the choroid and retina from contrecoup. Vision = $\frac{6}{18}$, with a defect in the superior field. Besides the lead in the anterior chamber, the skiagram showed several grains in the orbit, which in passing had wounded the right externus and levator of the eyelid, explaining the slight ptosis and convergent strabismus.

First aid in injuries to the eyes from lime has been considered by Hoppe,¹ of Cologne, who recommends providing workmen with a broad-necked gelatin bottle closed up by a gelatin cap containing 10 gm. of a lanolin salve with 2 % holocain. For use the cap is knocked off and the salve squeezed beneath the lids.

OCULAR SYMPTOMS IN GENERAL DISEASES.

The influence of the infectious fevers in the production of ocular affections.—In 2 cases recently reported by B. K. Chance² scarlatina produced orbital cellulitis, a rare sequel of this disease. The intensity of the affection was so great that death eventually ensued in both instances. The exact cause of the fatal termination, however, is much in doubt. This same author³ has carefully analyzed the ocular complications of variola. In over 2000 cases at the Municipal Hospital, Philadelphia, there were 36 instances of corneal ulcer, of which 17 were followed by perforation with destruction of 1 eyeball, and 15 were cured without perforation. Of these, 15 were in unvaccinated individuals; in 6 others, vaccinated at periods more or less remote, the lesions were less severe. Chance says that specific lesions of smallpox do not involve the cornea, and the corneal complications arise as secondary affections dependent upon the intense conjunctivitis encountered in these cases. [That the specific lesions of this disease are not responsible for the ocular complications is by no means proved. That they may be the same lesions altered by the histologic structure of the region in which they occur is shown by analogy; the hard papule of syphilis becomes a moist papule or mucous patch on mucous surfaces; the lesions of scarlatina and measles are likewise altered when occurring on the pharynx. Why should variola be an exception?] The conjunctivitis usually appears on the fifth day, and is in direct proportion to the eruption on the face and eyelids. Pustules seldom occur on the conjunctiva. In only 3 instances out of 2000 cases were they observed. Iritis occurred in 10 cases. Parenchymatous keratitis occurred in but 2 cases. Of serous iritis 10 cases were noted. Cicatrices of the eyelids and eyeball as the result of ulceration were frequently encountered. Dacryocystitis and inflammation of the nasal duct were observed as the result of pustulation.

Collomb⁴ reports a case of double iritis following mumps in a young man of 29. The right eye was attacked simultaneously with the swelling of the parotid glands and a marked posterior synechia was the result.

¹ Abstr. Jour. Am. Med. Assoc., Aug. 23, 1902.

² Amer. Med., June 13, 1903.

³ Amer. Med., April 18, 1903.

⁴ Rev. gén. d'Ophthal., vol. xxii, No. 2, p. 75.

A subacute iritis of the left eye followed a month later, with resultant synechiæ, that could not be broken by vigorous atropin instillations.

Gradle,¹ in a review of the eye-symptoms of nervous diseases, states that monocular or binocular blindness with normal pupillary reaction is a manifestation of **hysteria**. **Tubular visual fields** in the absence of fundus changes have been observed in hysteric girls by Greef² and others, and they are now considered hysteric manifestations. Ogusti³ observed this symptom combined with crossed diplopia for near vision in a hysteric individual.

Neuburger⁴ records 2 cases in which **myopia** was suddenly produced in the course of **diabetes mellitus**. Hirschberg was the first to demonstrate that myopia may develop in the course of diabetes mellitus in eyes previously emmetropic or hypermetropic without turgidity or opacity of the lens. The explanation usually given that the myopic change is due to the altered refractive index of the lens-substance induced by the glycosuric state is not very convincing, as the myopia may disappear abruptly and the diabetic changes elsewhere increase. Neuburger makes a plea for a careful examination for glycosuria in all cases of myopia beginning in middle life.

According to some observers, the **diagnostic importance of inequality of the pupils** is much overrated. L. Naxera,⁵ in an examination of 500 cases, found anisocoria in 88 cases, or 17.6 %. In 15 cases only was there an organic lesion of the nervous system, whereas in 73 cases the condition was physiologic.

Paradoxic reaction of the pupil in accommodation was observed by W. G. Spiller⁶ in 3 cases in which the pupil became smaller on fixing on a far object, and larger on fixing a near object; and larger when the eyeball was directed downward and inward, the other eyeball being covered. In only one of these cases was organic nervous disease unquestionably present, so that Spiller hesitates to consider this phenomenon as a positive indication of organic disease of the nervous system.

The **exophthalmos of Basedow's disease** has usually been considered necessarily bilateral. Trousseau⁷ and Guilbert⁸ both record well-marked cases of this affection, attended only by unilateral exophthalmos.

Ergot and its preparations were noted by Traube in 1770 to produce ocular disturbances, but the experimental study of this poison has only been recently given careful attention by K. Ch. Orloff.⁹ In order to determine the effects of ergot and its derivatives on the eye, he inoculated a series of 21 animals with ergotin, ergot infusion, sclerotinic acid, sphacelinic acid, and cornuto-sphacelinic infusion. In all the injected animals, symptoms of poisoning appeared, and in some they were followed by death. Special attention was paid to the condition of the eyes, and in 4 animals cataracts were found as the result of the injections. There was also dilation of the pupils and absence of reaction to light, and in some

¹ Chicago Med. Recorder, Jan., 1903.

² Ann. of Ophthal., Jan., 1903.

³ Wien. med. Woch., May 3, 1902.

⁴ La Clin. Ophthal., April 10, 1902.

⁵ Berl. klin. Woch., May 16, 1902.

⁶ Münch. med. Woch., No. 12, 1903.

⁷ Phila. Med. Jour., May 2, 1903.

⁸ Ibid., May 10, 1902.

⁹ Roussky Vrach, Dec. 14, 1902.

animals a distinct impairment of vision. Microscopically, the changes noted in the ganglion-cells of the retinas of these animals were: (1) Disintegration of Nissl's bodies; (2) destruction of these bodies at the circumference; (3) complete dissolution of these bodies, so that the cells stained diffusely with the specific dyes; (4) indistinctly outlined nuclei; (5) vacuolization of the protoplasm; and (6) complete disintegration of the ganglion-cells. C. O. Hawthorne¹ describes a case of double optic neuritis and sixth nerve palsy in a chlorotic girl which he attributes to intracranial thrombosis. Upon treatment by rest and the internal administration of iron the condition subsided entirely.

Metastatic Ophthalmia.—C. Zimmerman and Brown Pusey² have described in detail a case of purulent metastatic ophthalmia which occurred in the course of meningitis. It gave rise to manifestations of meningitis and sympathetic disease 13 years later. A subsequent enucleation was followed by recovery.

In a case of congenital heart-disease in a boy aged 9 years, reported by S. M. Hamill,³ W. C. Posey detected a neuroretinitis of marked degree. The retinal arteries and veins were swollen and tortuous, resembling large angle-worms. The disc was obscured by the swollen retina and there were a few hemorrhages in the nerve-fiber layer close to the nerve-head.

The association of retinal changes with mental disease is well shown by the report of Kuhnt and Wokenius.⁴ Of the 511 patients examined by these observers, 143 possessed fundus changes. Optic atrophy was observed 4 times; choked disc once; optic neuritis 4 times; neuroretinitis once; hyperemia of the disc 11 times; pallor of the nerve 12 times; pallor of the temporal half of the disc 17 times; retinal hemorrhage 4 times; retinitis punctata albicans once; connective-tissue changes in the retina 3 times; Uhthoff-Klein cloudings in the retina 27 times; disc-shaped cloudings in the macular region 34 times; foveal changes 42 times; central chorioretinitis 3 times; central choroiditis 14 times; central myopic choroiditis 13 times, and simple glaucoma 3 times. The reddish-yellow spots which surrounded the fovea were found associated with paranoia and dementia in 19 instances; with paralytic dementia in 2 instances; with periodic dementia in 2 instances; with senile dementia once; with the mental disturbance of epilepsy in 7 instances; with melancholia twice; with mania 4 times; with imbecility twice and with idiocy once. This interesting study demonstrates the necessity of routine ophthalmoscopic examinations in all mental disturbances and also points out the importance of a careful neurologic investigation in cases presenting unaccountable central retinal changes.

THERAPY.

Perhaps the greatest advance in ocular therapeutics is the adaptation of the x-ray for curative purposes. As already mentioned, Mayou,⁵

¹ Brit. Med. Jour., Feb. 8, 1902.

² Ann. of Ophthal., July, 1903.

³ Pediatrics, May, 1903.

⁴ Zeit. f. Augenheilk., Feb., 1903.

⁵ Lancet, Feb. 28, 1903.

discusses the use of the **x-ray** in locating foreign bodies and in the treatment of rodent ulcer and trachoma. He believes the **x-ray** is effective through the leukocytosis its application causes. Sydney Stephenson¹ reports 2 cases of tuberculosis of the conjunctiva in which cure was produced by its use. The newly discovered element **radium** promises to produce more startling results. Javal and Curie² have made numerous studies with a very active radium salt, placing it in a covered glass vessel, and this in a dense pasteboard box through which no ordinary light could pass. Two men absolutely blind, one as the result of optic-nerve atrophy, the other through glaucoma, did not perceive the presence of the light at all. A third individual, afflicted with prolapse of the retina, retained light-perception in a small portion of his visual field. When exposed to the radium rays he announced at once the appearance of a light, and precisely in that part of his visual field which corresponded to the inviolate portions of his retina. A fourth individual, blinded by ophthalmia neonatorum, had thick corneal scars, form-perception was completely lost, color-perception was present to a slight degree. Exposed to the radium rays, he at once noticed a lighting up of his visual field, even after the eye was covered with both hands. In a fifth case, the eye had become glaucomatous after an iridectomy, and all form-perception was lost, light-perception was retained; later the lens became cataractous, and light-perception also failed. In case of prospective operation, knowing that a sensitive retina would perceive the approach of the radium light, one could determine whether or not the removal of the cataract would be of service.

A. Benedetti³ presents the results of his experiments with **silver fluorid**, a salt discovered by Paterno in 1901, and to which the name **tachiolo** has been applied. He finds it useful as a collyrium, in solutions varying in strength from 1:1000 to 1:100. Solutions of greater strength than the latter produce irritation. Instillations of this salt seem very useful in cases of catarrhal conjunctivitis, owing to its antiseptic potency to its superiority over silver nitrate.

Schuftan⁴ reviews the literature of **sublamin** and concludes that it is more effective and less irritating than mercuric chlorid.

A. Chtchepinsky⁵ employs the soluble salts of **soziodolic acid** (bi-iodoparaphenolsulfonic acid), especially **sodium soziodolate** or **zinc soziodolate**, in acute or chronic conjunctivitis in a 2% to 6% solution. In mild cases he confines himself to simple lavage, at first with a medicated solution, then with water; in the graver forms he begins by freeing the lids and conjunctiva from pus and the products of secretion, then he drops 2 or 3 minims of the soziodolate solution into the conjunctival sac. Usually this is done once a day, but it may be repeated morning and evening. In the majority of cases it causes a burning sensation which diminishes in 5 minutes, to disappear completely at the end of about 15

¹ Brit. Med. Jour., May 3, 1902, and June 6, 1903.

² Bull. de l'Acad. de Méd., 1902, xlvii, 478.

³ Il Policlinico, June 14, 1902.

⁴ Inaug. Dissert. Berl., Aug. 15, 1902.

⁵ Abstr. Amer. Med., Jan. 10, 1903.

minutes, without causing an increase in the hyperemia or photophobia. In some cases it is not accompanied by any disagreeable sensations. Under this treatment the inflammatory phenomena quickly disappear; the purulent secretions become purely catarrhal. In Chtchepinsky's experience zinc sozoiiodolate is particularly efficacious against acute conjunctivitis, as well as in subacute outbreaks of chronic conjunctivitis.

Bellencontre¹ advocates **hyperiodized oil (iodipin and lipiodol)** as a substitute for iodine and potassium iodide. Iodipin contains 25 % iodine and lipiodol 40 %; both are colorless and tasteless and do not disturb the stomach or produce iodism. A. Adamkiewicz,² Vienna, reports the restoration of sight in an eye nearly blind as the result of cancer by the repeated injection of **cancroin**.

Roemer³ advises the use of **jequiritol** and **jequiritol serum** as substitutes for the infusion of jequirity beans in the treatment of trachoma. This has also been recommended at a more recent period by Carl Hood. H. Salomonsohn⁴ speaks favorably of **yohimbin**, a new local ocular anesthetic discovered by Magnani in Turin, by whom it is employed in 1 % solution. It produces anesthesia in one minute and its effect lasts a half hour. R. Mengelburg⁵ advises caution in the use of **atropin** and **adrenalin** combined, owing to the great tendency of such a mixture to induce symptoms of atropin-poisoning in individuals otherwise insusceptible to the drug. Darier,⁶ Paris, describes a new mydriatic, **bromide of methyl atropin**, which in 1 % strength induces mydriasis lasting 24 hours, and cycloplegia which extends over two or three hours.

Subconjunctival injections of saline and other solutions have been studied experimentally by K. Wessely⁷ to determine the manner in which their effects are produced. He discards the theory of osmosis in this connection and supports this statement by the results of analyses of these various solutions which have shown their penetrating effect to be very small. Neither do they act as lymphagogues nor by any direct action in setting free leukocytes, according to his studies. They really act by powerful local stimuli to the conjunctiva, and even when frequently employed have no injurious effects. The nerves of the conjunctiva thus energetically stimulated act in a reflex manner, presumably through the vasomotor nerves in the vessels of the adjoining vascular territory, leading to dilation of the ciliary area. The hyperemic condition of the ciliary vessels renders their walls more permeable, and the result is the secretion of aqueous humor containing much albumin, in the place of normal aqueous which contains none. Wessely observes a similarity in action between the injected solution and the edema that accompanies inflammation, and that both in inducing an increase in the albumin in adjacent fluids serve as safeguards by the several protective materials [**bacteriolysin**, **agglutinin**, **hemolysin**, **precipitin**] contained in the albumin secreted.

¹ La Clin. Ophtal., July, 1902.

² Medicine, Jan., 1903.

³ Graefe's Arch. f. Ophthal., lii, Hefte i, 1901.

⁴ Woch. f. Therap. u. Hyg. des Auges, No. 28, 1903.

⁵ Woch. f. Therap. u. Hyg. des Auges, No. 32, 1903.

⁶ La Clin. Ophtal., Nov., 1902.

⁷ Abstr. Lancet, London, April 4, 1903.

INSTRUMENTS AND APPLIANCES.

N. Bishop Harman¹ has devised a **portable refractometer** for convenience in retinoscopy and rough subjective tests (Fig. 113). To each outer extremity of the face-piece of the skeleton trial-frame is affixed a pivot; upon each pivot there rotates a disc. The discs (3 inches in diameter) are perforated by 7 holes ($\frac{1}{4}$ inch in diameter); 1 is open, and 6 are glazed with lenses from 1 D. to 6 D., the disc of one side with plus

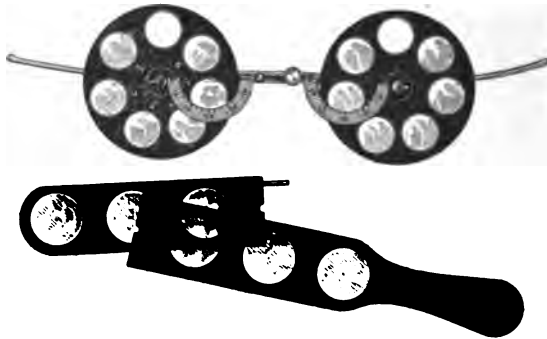


Fig. 113.—Harman's portable refractometer (Brit. Med. Jour., Feb. 18, 1903).

lenses, the other with minus lenses. By rotating the discs the lenses come in succession before the eyehole, and, since the instrument is reversible, either disc may be placed before the eye to be examined. If a higher sphere than 6 D. is desired, a 7 D. or, if necessary, a 14 D. lens is placed in the cell hanging in front of the eye-hole, so that by rotating the disc as before from 1 D. to 20 D. are obtained. For fractions of a diopter an

independent flat rule, carrying 6 lenses + and — 0.25, 0.5, 0.75, with a space, is provided; this “fraction rule” is held vertically before the eye first at the central space, then raised or lowered as + or — fractions may be desired.



Fig. 114.—Jackson's magnifier with illuminating mirror (Jour. Am. Med. Assoc., Nov. 22, 1902).

Edward Jackson² describes a **binocular magnifier** with an illuminating mirror attached to a hard-

rubber head-band as an aid in the performance of operations upon the eye (Fig. 114). The great advantage of this apparatus is that it allows the free use of both hands.

This same observer³ has devised an **instrument for measuring the forward projection of the eyeball**. For this the name **protometer** has been suggested. It consists mainly of a rule with one straight and

¹ Brit. Med. Jour., Feb. 18, 1903. ² Jour. Am. Med. Assoc., Nov. 22, 1902.

³ Am. Jour. Med. Sci., July, 1903.

one curved edge with parallel lines on the upper surface, along which the observer sights and is thus enabled to measure the degree of prominence of the eyeball. The instrument measures within 0.5 mm.

N. Bishop Harman¹ describes a **scotometer** (Fig. 115), an instrument used for the detection of central scotomas. Behind a screen in which is cut a square aperture there rotates a disk bearing squares of red and green color—2 mm., 3 mm., 5 mm., and 7 mm. in diameter. The rotary disk has an automatic check action, so that it stops as each successive test is brought into the aperture. The observer, using the nose as a convenient point of fixation, can pass the scotometer over it and judge the presence and extent of color disturbance in the patient by his perception of the color of a larger or smaller square or by the movements of a square of given size from the fixation point. The color squares are of the greatest range and size conformable with the handiness of the instrument, which is of the same size and thickness as the usual $1\frac{1}{4}$ -inch trial lens, so that it finds a convenient place in the ophthalmoscope pocket-case or in a slot of a trial-lens case.



Fig. 115.—Harman's scotometer (*Lancet*, July 12, 1902).

Martin Jansson² has constructed an instrument to which he applies the name **siderophone**, and which is intended to overcome the disadvantages of Asmus's sideroscope (Fig. 116). The principal part of the instrument consists of two cylindric-shaped pieces of iron, united by a framework of ebony, and placed so that the smaller piece (*b*) is at right angles to the larger (*d*). The latter is surrounded by a middle-sized copper wire,

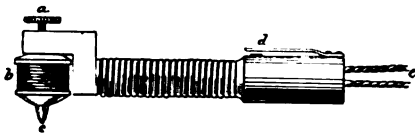


Fig. 116.—Jansson's siderophone (*Brit. Med. Jour.*, Nov. 1, 1902).

which is connected with a small Helesen's dry element, fitted with an interrupter. The smaller piece of iron is surrounded with very fine copper wire, which leads to a common telephone trumpet. When the electric current from the dry element is closed and the

interrupter acts, the larger piece of iron becomes magnetic, and again influences the smaller piece of iron. This induces a current in the copper wire by which it is surrounded, and this secondary current is led to the telephone trumpet, where it is heard as a sound by the ear. The smaller piece of iron is placed so that the axis of the larger piece divides it carefully in half. Thus two electric currents of different directions arise which meet in the telephone; if these currents are equally strong, they neutralize each other, and there is no sound to be heard in the trumpet. But if

¹ *Lancet*, July 12, 1902.

² *Brit. Med. Jour.*, Nov. 1, 1902.

the end (c) is approached to the smallest iron splinter, the current is increased in the corresponding half. A sound is then produced in the telephone trumpet. The adjustment of the instrument is made by a screw (a), which contains a small iron splinter. At a certain position of the screw the two currents are equally strong. If it is unscrewed, the current at the opposite end is stronger. The instrument is most sensitive when the above-named side is slightly overbalanced.

W. Martindale¹ has overcome the difficulty of keeping eye-drops sterile by keeping the solutions in small glass tubes sealed at both ends. An injector accompanies each case of two dozen, and in using them each end should be broken off, after which the ejector is applied and the drops instilled. The same principle has long been in use in connection with the vaccine virus tubes.

Photographing the Ocular Fundus.²—The difficulties of photographing the intraocular picture are many, and heretofore efforts in this direction have met with little success. The retina must be illumined from without through the small pupillary aperture, and the rays of light must traverse all the mediums twice. Again, the dark red of the ocular fundus is a very poor photographic color, and the photograph must be taken almost instantaneously. However, Dimmer³ has recently exhibited at Gratz some very satisfactory photographs of both normal and diseased eye-grounds. One-half of the pupil was utilized for illumination with a special mirror covering only that half, while through the other half a photograph of the corresponding side of the retina was made. The pupil was dilated ad maximum and the patient was instructed to fix one eye upon a bright point while the camera was directed toward its fellow.

¹ Brit. Med. Jour., Sept. 27, 1903.

² Amer. Med., April 25, 1903.

³ Berl. klin. Woch., Dec. 8, 1902.

DISEASES OF THE NOSE, THROAT, AND EAR.

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DISEASES OF THE NOSE.

An Unusual Case of Nasal Syphilis in a Child and a Consideration of Syphilitic Nasal Tumors (Syphilomas).—C. F. Theisen¹ reports an interesting case of a boy, aged 7 years, illustrating the difficulties sometimes met in making a correct diagnosis. The only history that was at first obtained from the boy's mother was that during the past 8 or 9 months he had been breathing very badly, the difficulty having increased very much during the past 2 or 3 months. He had lost weight and slept poorly; in fact, had to almost sit up in bed during the night. On examination both nostrils were found completely occluded by tumors about the size of small cherries springing from the septum. In each nostril there were two tumors, one of which had a distinct pedicle and looked somewhat like a papilloma. They were fairly firm to the touch, of slightly irregular shape, grayish in color, but covered with an intact mucous membrane, which showed absolutely no evidence of ulceration. The pharynx and larynx showed normal conditions, with the exception of slightly enlarged tonsils. The boy's father had died of tuberculosis and his mother had lost a sister from the same disease, but at this time no history of syphilis could be obtained. Owing to the mother's objection to operative procedures the boy was treated locally and given Fowler's solution for a time, but his condition finally became so pitiable that an operation was permitted. Under general anesthesia both nostrils were thoroughly cleaned out; examination with the probe failed to reveal the presence of caries. He improved very much for a time, but within 2 months both nostrils were again completely obstructed. The mother then finally admitted that her husband had acquired syphilis, and that she had been infected before the birth of this child. The boy was given potassium iodid and began to improve at once. Within 2 months he was practically well, and at present, 6 months later, both nostrils remain entirely free. An examination of the removed growths showed that the tissue was made up of round-cells, with here and there cells similar to spindle-cells. There was also a connective-tissue formation, and thickening of the walls of the bloodvessels. Neither tubercle bacilli nor tubercles were present. This examination, with the result of the treatment, made the diagnosis of syphiloma positive. Theisen thinks the case of unusual

¹ Jour. Am. Med. Assoc., Feb. 28, 1903.

interest, since it presents a case of congenital syphilis—the only indication of the disease being the presence of the nasal tumors—which had never before received antisiphilitic treatment, and nevertheless the nasal growths at the time of examination showed no evidence of breaking down. This one fact, without the histologic examination, is enough to prove that they were neither gummas nor tuberculous granulomas. Another interesting point is the distinct pedicle one of the tumors had and the presence of the syphilomas in both nostrils.

The Presence of Diphtheria Bacilli in Atrophic Rhinitis.—J. O. Symes,¹ in a report of 23 cases of atrophic rhinitis, the patients varying from 9 to 57 years of age, and in which the average duration of the disease was 7 years, found a bacillus in 20 of the cases resembling in morphologic and cultural characteristics the Klebs-Löffler bacillus. In 17 cases the organism was of the long variety, and in 3 the short. To ascertain whether these were true diphtheria bacilli, a series of cultures was made from the noses of healthy children; in no instance were any long diphtheria-like bacilli found, but in 58 % a short pseudodiphtheric type of bacillus was present. A series of cultures was also taken from persons suffering from ozena secondary to congenital or acquired syphilis and lesions other than atrophic rhinitis, in none of which were diphtheria-like bacilli found. By inoculation experiments on animals he then found that the organism present in the atrophic cases proved to be a virulent diphtheria bacillus. On these experiments he based the following conclusion: If the foregoing facts can be substantiated and the identity of this bacillus with the Klebs-Löffler bacillus can be established, then we may regard atrophic rhinitis as a chronic form of nasal diphtheria. In addition to the bacteriologic evidence, the following points seem to support this theory: (1) The accessory sinuses of the nose are constantly infected in diphtheria. (2) Chronic sinus-suppuratation is looked on as the direct exciting cause of atrophic rhinitis. (3) Multiple cases of atrophic rhinitis exist in the same household from time to time. (4) An attack of diphtheria may be the starting-point of atrophic rhinitis. (5) Atrophic rhinitis, like diphtheria, attacks females more than males, and is a disease of early life. (6) Atrophic rhinitis has been successfully treated by diphtheria antitoxin. (7) In atrophic rhinitis the type of diphtheria bacillus does not alter.

Adenocarcinoma of the Nose.—H. Cordes² makes observations concerning other recorded cases of this character, with the report of a case of his own in a man 75 years of age, in the treatment of whom electrolysis was found to be of marked benefit, reducing the growth to such a degree that its total extirpation was readily accomplished. After 9 months no recurrence was perceptible.

The Use of Cargile Membrane in the Nose to Prevent Adhesions.—H. P. Mosher³ reports satisfactory results with the use of cargile membrane as a dressing on the septum after the operation for the correction of deflection; as a sleeve for a packing which has to be left in the nose for

¹ Brit. Med. Jour., Feb. 28, 1903.

² Berl. klin. Woch., Feb. 23, 1903.

³ Boston M. and S. Jour., Feb. 26, 1903.

any length of time; on the turbinates after cauterizing, in order to keep the cauterized turbinate from cauterizing the septum opposite; to hold down flaps of mucous membrane after the submucous dissection of cartilaginous spurs; in fact, after any operation in the nose in which adhesions are likely to result. Owing to the difficulty of application of a single layer he secures it in place by folding the membrane into a wedge-shaped strip several layers thick and then introduces it just as an ordinary packing would be inserted between the cut ends of the adhesion.

Case of Intractable Nasal Hemorrhage Successfully Treated by a New Method.—G. Hunter Mackenzie¹ reports a case of persistent hemorrhage from the anterior third of the septum about 1 cm. above the nasal floor. Cocain and adrenalin were applied on pledgets of cotton without effect, after which the electrocautery was used with the same futile result. After these methods had been used for 2 days, with continued periodic attacks of bleeding, the entire mucous membrane over the bleeding surface was curetted away; following this the hemorrhage soon ceased of its own accord. This case, he states, is the only one in his experience in which the galvanocautery failed to control the hemorrhage, and thinks that the method resorted to is submitted for the first time.

Treatment of Atrophic Fetid Rhinitis by Interstitial Injections of Paraffin.—A. Brindel² has made the experiment of applying the paraffin-injection idea brought out by Gersuny and Eckstein to the treatment of atrophic rhinitis, by injecting it into the atrophied turbinates, thus favoring the expulsion of decomposing secretions, and perhaps modifying the character and quantity of the secretion as well. In 10 cases reported not only was the desired mechanical result effected, but the morbid secretions underwent a marked and rapid change with the consequent disappearance of the ozena and crust-formation. The technic consists in the injection of the paraffin mixture recommended by Eckstein into the inferior turbinates. With the aid of cocain the operations were made painless, only 2 cases being followed by any ill results, these being a phlebitis of the facial vein, which, however, gave no serious permanent effect.

The Etiology of Nasal Polyps, with Especial Reference to Their Association with Other Pathologic Conditions.—Francis R. Packard³ points out the confusion in the nomenclature employed in reference to nasal polyps. The paper is accompanied by original drawings of a number of sections of polyps, taken from different cases, in not one of which is there any evidence of the structure of a true myxomatous tumor; in all of them, however, there was mucoid degeneration. In all of the cases the polyp was associated with the presence of dead bone in the nose. The sooner the profession realizes that nasal polyps are symptoms of underlying conditions, and not merely "tumors," the mere removal of which will result in a complete cure, the greater will be the benefit to all

¹ Brit. Med. Jour., Sept. 27, 1902.

² Rev. Hebdom. de Laryng., June 21, 1902.

³ Trans. Amer. Laryngol. Assoc., 1903.

concerned. The frequent recurrence is undoubtedly due to a failure to remove their underlying cause.

Rubber Splints in the Treatment of Septal Curvature.—J. Price-Brown¹ says that while vomeric ridges and exostoses may extend all the way back to the posterior nares, curvatures are usually confined to the anterior two-thirds of the septum, and the majority to the triangular cartilage. It is in the treatment of the latter class of cases that rubber splints are particularly suitable. In speaking of the etiology of these conditions, he claims that whatever may be the primary cause of the curvature, the habit of wiping the nose from the convex toward the concave side is habitual in almost all these cases, and has a serious effect in aggravating the deformity. His experience differs from some clinicians, also, in the character of curvatures usually found. When the principal bend is in the triangular cartilage, any extension backward into the vomeric region, whether as curvature or ridge, has in the majority of instances been on the same side. Quite frequently one side of the triangular cartilage is deeply concave or book-notched in form; and it is in this class of cases that rubber splints are specially useful. They are made from pure rubber sheeting of varying thickness— $\frac{1}{8}$, $\frac{1}{4}$, or $\frac{3}{8}$ inch—and are cut by the operator by means of scissors and sharp knife to the required shape and size, and then the edges smoothed by the use of a steel file and sand-paper. To prepare them for use, they are immersed in an antiseptic solution and before insertion smeared with vaselin to facilitate entrance into the nasal cavity. These splints cannot become septic any more than can the vulcanite, and have the advantage of elastic compressibility which the harder material does not possess. To reduce the curvature, the nasal passages are first cleansed by the use of antiseptic sprays, etc. Then a 1 % solution of cocain is thrown into each nasal cavity, followed by a 5 % to 10 % solution applied on a cotton holder to both sides of the septal cartilage, followed by a solution of adrenalin. Any existing spur or ridges are next removed by saw. Either on this occasion or on a subsequent one, the septum is next cut on its convex side by one, two, or three linear incisions, from behind forward, the cuts being parallel to each other. The level of each incision is made to suit the special condition of each case. The incision may or may not penetrate the mucous membrane on the opposite side of the septum. This must be determined by the judgment of the operator. By the finger or strong spatula, the septum is then pressed into the mesial line, and the splint, made specially for the case, inserted. It should fit with moderate tightness, and by its elasticity keep the septum in position. The advisability of moderate tightness on the part of the splint is illustrated in several ways. Not only does it keep the septum in position, but it promotes absorption of any roughened edges that may be occasioned by overlapping; while the smooth, flat surface of the splint, presented to the cartilage, insures in large measure a smooth septum as a result. After insertion, if the splint fits and retains its position, it should not be removed at all until healing and solidity have been accomplished, whether this

¹ Laryngoscope, Aug., 1902.

takes 2 weeks, 4 weeks, or even longer. Still, the patient should for a time be under the regular supervision of the surgeon, and the passage cleansed daily of exuded secretions, by means of carefully applied cotton holders, etc. When the operation with regard to hands and instruments is done antiseptically, and within the nasal passage is placed a smooth, compressible, aseptic body, which—as stated by Lake—cannot become septic, and when by proper care the parts above and below the splint can be regularly cleansed, it is difficult to believe that the continuous retention of the instrument, during the process of healing, can be productive of any undesirable results. The paper closes with a record of 7 cases all treated in this manner, the results in all being satisfactory. The periods of continuous retention of the splint in these cases varies from 1 week to 4 months. In the last case, after wearing the splint for 1 week, with Price-Brown's consent the boy, aged 13 years, was taken home by his father, with instruction to return to have the splint removed a month later. The letters received, however, were so satisfactory that the period was allowed to extend, and it was only upon insistence that he finally came back to have it removed at the expiration of 16 weeks. No harm had accrued from the prolonged retention.

The Use of Suprarenal Extract in Hay-fever.—J. Payson Clark,¹ from the experience of two summers in the use of suprarenal extract in hay-fever, draws the following conclusions: Of the 3 forms in which he used this substance,—*i. e.*, powdered desiccated capsules, solution of suprarenal extract with chloreton, and solution of adrenalin chlorid (Takamine),—he found the last-mentioned most reliable and satisfactory. In simple vasomotor rhinitis, with no discoverable local abnormality and no general dyscrasia, suprarenal extract used locally appears to give favorable results in a large proportion of cases, either entirely preventing or much diminishing the severity of the symptoms. In cases of hay-fever in which there is some local abnormality in the nose, the suprarenal extract does not act favorably until such abnormal condition is remedied. In cases in which there is a rheumatic or allied dyscrasia, the suprarenal extract is apt to cause some reaction at first, and in any event does not act as favorably as in uncomplicated cases.

Deformity from the Injection of Paraffin.—H. H. Curtis² reports the case of a young woman who had received an injection of paraffin for the removal of a depression at the junction of the lip and nose. The operation had been done by a physician who claimed to be skilful in this line of work, but the result was unfortunate, for the paraffin had escaped and had made two exceedingly unsightly swellings on the sides of the nose and below the orbits. [This is but one of many deplorable accidents which have happened as a result of Gersuny's suggestion for the relief of deformity by the hypodermatic injection of paraffin. It cannot be insisted on too strongly that this procedure should be used with the greatest care, caution, and skill, and not the least of the precautions to be adopted is that the immediate area whose contour it is intended to change

¹ Boston M. and S. Jour., June 19, 1902.

² Laryngoscope, April, 1903.

should be so firmly isolated that escape of the paraffin into surrounding areas is rendered absolutely impossible.]

Experiments on the Nature and Specific Treatment of Hay-fever.—Sir F. Semon¹ states the following as the result of his experience: (1) There can be no doubt that Dunbar has succeeded in extracting from the pollen of certain grasses a toxin which, when instilled into the eyes or nostrils of people predisposed to hay-fever, produces in these parts the characteristic subjective and objective symptoms of the disease. (2) The toxin, when injected into the eyes or nostrils of people not predisposed, produces in the great majority of cases no symptoms whatever. But it certainly appeared as if there were instances of transition in which, although the persons experimented upon never suffered from typical hay-fever, they were yet more susceptible to the influence of the toxin than the ordinary run of people. (3) The effects of the toxin in people suffering from hay-fever are as variable in intensity as are the attacks of the affection itself, with regard to both the local and the constitutional symptoms. (4) Dunbar's antitoxin certainly produced immediate disappearance of the subjective, and, after a few minutes, great amelioration of the objective, symptoms. (5) The mixture in equal parts of a toxic solution (1:500) and the antitoxic serum suffices to neutralize the specific effects of the toxin. (6) The effects of the antitoxin appear in some instances to be sufficient to prevent a reappearance of the subjective symptoms, while in other instances repeated instillations of the antitoxin were required to produce ultimately the return to normal conditions. But all we know at the present is not sufficient to build therapeutic hopes on, and this for the reason that we are ignorant of the nature of the special predisposition which exists in hay-fever subjects.

Adenoma of the Nose with Incipient Sarcomatous Metamorphosis.—Emil Mayer² reports a case of this affection occurring in a man aged 68. The points of interest are: the immense size of the tumor, weighing 117 grams when removed; the unusual methods required in operation, consisting of tracheotomy and external operation; and the absorption of all intranasal bones, the cartilage remaining intact. The patient made a complete recovery; there had been no recurrence 4 months after the operation.

The Asch Operation for Deviations of the Cartilaginous Nasal Septum, with Conditions Complicating Its Performance.—Emil Mayer³ reports 3 cases of deviations of an unusual nature, the first being an S-shaped deviation with dislocation of the columnar cartilage; the second, complete occlusion with many points of adhesion of the septum and inferior turbinate; the third, with an orbital tumor complicating the deviation and where the operation was advised as a means of diagnosis. He further combats some of the statements made by other writers that the Asch operation is performed without the aid of sight, that it is one requiring unusual force, that the operation is one of magnitude, and that

¹ Brit. Med. Jour., March 28, 1903.

² Amer. Med., Aug. 2, 1902.

³ Jour. Am. Med. Assoc., March 7, 1903.

the tubes occasion the formation of granulation-tissue. He concludes as follows: The last word regarding any operative procedure is never spoken; the more popular it becomes, the more frequently it is mentioned and assailed. By our own mishaps and those of others we learn to avoid these and perfect our technic. Intelligent and fearless criticism is cordially welcomed, and it becomes incumbent on us to weigh these carefully and to answer them as best we may in the same cordial spirit.

A Rapidly Recurring "Bleeding Polyp" of the Septum Nasi Appearing Twice in a Woman, Each Time at the Seventh Month of Pregnancy.—Jonathan Wright¹ reports the following case, interesting in the light of the anatomic and clinical interrelation between the erectile tissue of the sexual organs and that of the nose. The patient was a woman aged 25, with a history of the septum having been burned several years previously for obstruction, and from this a perforation had resulted. Since that time she had been married and was 7 months pregnant. Springing from the posteroinferior edge of the perforation was a round vascular growth, which, after removal, showed nothing but very vascular granulation-tissue. It recurred rapidly and on second removal bits of underlying cartilage were removed with it. This specimen showed some disordered cell structure and greater vascularity than the first. About a year later the woman returned with the history that there had been no noticeable recurrence until she had again reached the seventh month of pregnancy. The tumor at this time was attached mainly to the inferior border of the perforation and was of the same appearance as the previous ones. It was removed and rapidly recurred, and on further removal gave the following appearances: There was an outer layer of degenerated flat epithelium and underlying it a layer of what appeared to be hyaline degeneration of the connective tissue. The mass of the growth was made up of loose edematous connective tissue containing a large number of mononuclear round-cells, which stained very deeply with hematoxylin, and the whole growth was traversed by numerous capillaries lined with a single layer of endothelium whose nuclei were much swollen and projected into the lumen of the bloodvessel. There was every evidence of considerable inflammatory action, but no proof of malignancy.

Failures in Attempted Correction of Septal Deviation.—Chevalier Jackson² enumerates 14 causes of failure in attempted correction of septal deviation. He concludes that "almost every case of deviation demanding operation requires resection of the inferior turbinal on the concave side for two purposes: to secure immediate correction of the septal deviation, and to secure adequate nasal respiration during sleep. It is an error to base the estimation of the adequacy of the nasal respiratory channel on either the patient's statement or the apparent size on inspection of the channel, whether the parts be cocaineized or not. If the imprint of the inferior turbinal is seen on the septum, it is a certain indication for a radical resection of the inferior turbinated body (including a fringe of bone) on the concave side. 'Soft' hypertrophies will expand at night and

¹ Am. Jour. Med. Sci., June, 1903.

² Trans. Am. Laryn., Rhinol., and Otol. Soc., 1902.

push upon the septum, yet shrink so small as to leave a large, free, and open channel during the day. They often do more harm than 'hard' hypertrophies, as they are often even more expansile. If left untouched, or, what amounts to the same thing, if temporized with by the utterly useless galvanocautery, the septum may as well be let alone, for the deflection will sooner or later reappear and be worse than ever." When a tube is needed, he uses Kyle's, though, if the resection of the turbinal be sufficiently radical, he seldom finds need of a tube, or of packing, to hold the septum in its new position.

DISEASES OF THE ACCESSORY CAVITIES.

The Prophylaxis of Sinus Diseases.—D. Bryson Delavan¹ states that, since of late years diseases of the sinuses adjacent to the nose have been so distressingly common, the cure of the disease is without doubt an unspeakable benefit to mankind; yet its effective prevention is a far greater one. It is well, therefore, that we should give it more careful attention in the hope that through a better understanding of the causes of sinus disease some suggestions may arise through the aid of which a certain number of cases may be altogether eliminated, and others, destined by reason of neglect to fall into serious trouble, may be quickly rescued. The writer believes that a large amount of sinus disease could be done away with if the knowledge of the general physician were sufficient to recognize its predisposing causes, or, where it has already developed, to appreciate its early acute symptoms and to apply a few simple principles of cure. He divides the causes into predisposing and exciting. Of the former are mentioned anything which seriously hinders free drainage from the upper half of the nasal cavity; various abnormalities of the septum, one of the most important of which is fracture with displacement where the narrowing occurs somewhere in the neighborhood of the middle turbinate; catarrhal thickening of the tissues of the upper and middle parts of the septum; hypertrophy or unusual size of the so-called tubercle of the septum; congestive and hypertrophic conditions of the soft parts of the middle turbinates; and anything which promotes acute or chronic irritation of the nasal cavities. Under exciting causes he places the acute infectious diseases, particularly influenza. Dental irritation, injury from fracture of the walls of the sinus, and not infrequently operations of the nasal cavity, in which the adjacent parts have been treated with violence or instruments not properly aseptic, have infected the parts. Probably another prolific cause of irritation is the inhalation of dust from filthy streets, and that which is necessarily associated with automobile racing may contribute a large addition to the list of cases. Among the microorganisms most commonly found are the streptococcus and staphylococcus, *Diplococcus pneumoniae*, *pneumobacillus* of Friedländer, and *Bacillus coli communis*. He touches on some of the more practical points of active treatment and summarizes the prophylaxis as follows: (1) By recognizing the conditions under which inflammation of

¹ Jour. Am. Med. Assoc., Feb. 21, 1903.

the sinuses is likely to occur and, if possible, removing them. (2) When removal of the predisposing conditions is not practicable, by guarding the patient against the various exciting causes which may determine an acute attack. (3) When acute inflammation is already threatened, by applying immediate treatment for its relief.

Transillumination of the Nasal Accessory Sinuses during Acute Coryza.—C. M. Cobb¹ reports the results of some work done in transillumination of the accessory sinuses during the course of an acute coryza. He states that the results are, of course, subject to all the sources of error that may be encountered in transillumination in general, and that the conclusions to be drawn must be accepted subject to this element of doubt. He divides a series of 30 cases into 4 groups: (1) those seen during the first 24 hours of the beginning of the acute coryza; (2) those seen during the later stages of the attack, or rather the cases in which the attack persisted longer than the usual cold and gave discomfort enough so that the patients sought relief through special treatment; (3) those who had pain either in the face or head; (4) those who had otitis media as a complication during the course of the acute coryza. He makes the following summary: (1) That to do satisfactory work it is necessary to have lamps of much greater candle-power than those usually sold by instrument dealers. (2) That it is rare to find the accessory sinuses dark on transillumination during the early stages of acute coryza. (3) That during the later stages of a prolonged attack it is the usual result to find one or more of them dark. (4) That hemicrania is often closely associated with antrum disease. (5) That it is almost the rule to find one or more of the nasal accessory sinuses involved when the ears are affected during acute coryza.

Observations on the Diagnosis of Nasal Sinusitis.—Walter J. Freeman,² although believing in the value of transillumination as a confirmative measure in making a diagnosis of frontal and antral sinusitis, thinks that generally too much reliance has been placed on it. The position of pus in the various parts of the nasal fossa and the presence of edema and congestion around the sinus openings are much more reliable objective symptoms. Clinically, frontal sinus disease is characterized by a late morning headache, fulness over the eyes on leaning forward, and exquisite tenderness at the inner angle of the orbital roof, so that when these symptoms are found in conjunction with pus at the peak of the vestibule, an almost positive diagnosis can be made. The swelling of the turbinates and a capillary attraction produced by the contiguous surfaces of the septum and the agger nasi, cause the pus to flow anteriorly instead of posteriorly into the hiatus groove. Among some of the more important signs of antrum inflammation may be mentioned the following: Pus flowing over the posterior end of the inferior turbinate; well-defined odors such as those of sulfuretted hydrogen and sour pus, and intermittent cacosmia. A sixth-year upper molar which has been capped should be considered most suspicious when a cause of antral disease is being looked for. Positive evidence of disease of the antrum

¹ Jour. Am. Med. Assoc., Feb. 28, 1903.

² Amer. Med., July 11, 1903.

may be obtained by washing out pus from the cavity, and this, in the majority of cases, can be done through the normal opening. The opening should first be sought by a delicate cotton-wound probe, the point curved down. The washing cannula, preferably made of hard rubber, must then be fashioned after that shape which by the probing has been found to enter most readily the ostium maxillare. While acute ethmoiditis is one of the most common of conditions observed during the prevalence of grip epidemics, the author has yet to see an exception to the rule that complete resolution takes place within a few weeks under appropriate local and constitutional treatment. Most cases of "chronic ethmoiditis" which he has seen have been inherited from other operators and have been cured by treatment of hitherto unsuspected frontal, antral, or sphenoid suppuration. In all cases except those of marked atrophy it is impossible to distinguish by the position of the pus between a posterior ethmoiditis and sphenoid disease. As crusts are found in the vault in almost any sinus suppuration, they are not of much importance in diagnosing disease of the sphenoid sinus. The presence or absence of pain and its position are not reliable symptoms for diagnostic purposes. The use of suprarenal extract in the nose is not advisable when an examination for sinus disease is being made, as the bleaching of the membranes renders the recognition of small amounts of pus very difficult. Alternate blowing of the nose and sniffing is a very good method of drawing the pus from the sinus openings so that it may be detected. The morning is the most favorable time for detecting pus from the frontal and ethmoid and the evening from the antrum and sphenoid sinuses.

Diagnosis and Treatment of Antral Empyema.—J. W. Barrett¹ calls attention to the remarkable frequency of this disease as compared with a few years ago, and attributes it to the fact that almost the only cases diagnosed formerly were the acute cases—cases in which there were pain and bulging. Such acute cases he thinks, however, exceedingly rare, while the chronic are very common. He thinks, moreover, that cases which have long been classed under general debility may be due to the disturbance caused by the presence of pus in these cavities and the constant swallowing of the fetid discharge. He favors transillumination as a diagnostic agent, though he does not regard it as infallible. In case of doubt he advises exploratory puncture, the nose first being sprayed with a 10 % adrenalin solution and cocain, the trocar being passed under the fore part of the inferior turbinate and then pushed out through the inner wall of the antrum, which is very thin in this position. A fairly large sized trocar with a gimlet point instead of the old-style sharp point is recommended, since with this the opening can be made gradually and thus avoid slipping through and puncturing the opposite side of the cavity. As soon as the trocar has entered the cavity it is withdrawn and soda bicarbonate solution syringed through the cannula. In the more obstinate cases he advises the usual opening through the alveolus or through the canine fossa.

Disease of the Maxillary Antrum.—R. Claoub² advocates opening

¹ Internat. Med. Jour., Oct. 20, 1902.

² La Sem. méd., Oct. 15, 1902.

the antrum through the nose instead of through a tooth socket or canine fossa, in order to prevent the conveyance of pus into the mouth and the possibility of a reinfection of the antrum from the mouth. He recommends the following procedure: By means of a long, straight, thin, but strong, bladed scissors the anterior half of the inferior turbinal is removed at its attachment. This renders easy access to the ostium maxillare, which is now enlarged to the extent of removing the inner wall of the antrum down to the floor of the nose, using for this purpose a trephine or suitably shaped chisel. When this is accomplished, free access to the antrum is afforded and thorough subsequent treatment can be carried out. Claoub states that the cures are obtained with greater rapidity than in the other methods of operating and that the results are much more permanent.

Empyema of the Sphenoidal Sinus.—F. W. Hinkel¹ reports an experience of 20 cases, the diagnosis in each instance being confirmed by operation. The pain was uniformly severe, but was not distinctly localized; it is occasionally located in the ears and the temporoparietal region. In 8 of the cases there had been chronic cough with purulent expectoration, and in 2 there had been considerable pharyngeal catarrh. In 7, polyp-formation was present. Irrigation through the natural opening was unsatisfactory because it failed to relieve the symptoms or control the pus-formation and often gave rise to headache. The best treatment consists in the removal of the anterior wall with a sharp spoon through the nose. Following this procedure in one case there had been severe secondary hemorrhage 10 days after the operation, which was attributed to wounding of the sphenopalatine artery at the time of the original operation.

Polyps in the Nasal Accessory Cavities, with Specimens.—A. R. Solenberger² accounts for the recurrence of nasal polyps by a study of the various pathologic conditions of the nasal accessory cavities. He begins with the general statement that the first degenerative force in the history of nasal polyps is an irritant; it may be of internal or external origin. It may be one of the many poisons eliminated by the respiratory mucosa from the blood, such as uric acid and the various irritants seen in gingivitis; or else it may be one of the numerous irritants in the atmosphere, material or organic. The process at which the initial point of attack is on the bone seems, from the pieces of diseased tissues examined in the various stages of its evolution, to be this: The periosteum is irritated, then infiltrated and easily separated; large cells appear in the soft tissues and osteoclasts in the hard tissues; then, as larger cells appear in the polyp, larger osteoclasts appear in the bone. These break down, disintegrate, and abscess and rarefying osteitis occur. The process seems to be the same in the bones of the nose; and the reason why polyps predominate more largely in the latter is due to the vastly greater air area of exposure to irritants, the presence in the nose of extensive areas of tissues of lower organization and less resistance in both internal and external irritants. This pathologic process explains why we see nasal

¹ Med. Rec., July 19, 1902.

² Phila. Med. Jour., Dec. 20, 1902.

polyps without pus, and why we sometimes find them without caries. When nasal polyps exist without pus, either there has been causal caries which has healed and left a stranded polyp, or the polyp is due to the limitation of the initial irritative force to the mucosa, the process having stopped short of bone erosion. A polyp situated at the orifice of the accessory cavities, more or less occluding it, may become a mechanical cause of creating suppuration, caries, and polypoid conditions in the cavity, and the persistent flow of pus over this orificial polyp may cause it to inflame and erode the bone beneath. In recurring polyps we frequently find evidence of more or less thorough work having been done; the anterior end of the middle turbinate and parts of the ethmoid bone are frequently absent, demonstrating that a rhinologist has been at work. In this case an effort must be made to carry out pathologic research deeper than our predecessor. What is true of the bony structure of the nose is likewise true with reference to the temporal bone, particularly the mastoid process. The most important far-reaching element in the

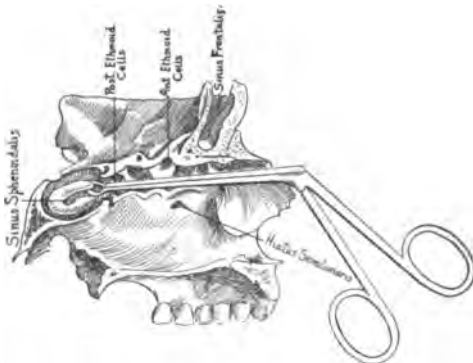


Fig. 117.—Showing avenue—ethmoid cells—through which sphenoid polyp was removed, and sphenoid cavity containing polyp (Solenberger, in Phila. Med. Jour., Dec. 20, 1902).

pathology of polyps is that in all advanced cases of tissue degeneration, when all surgical measures of curet and gouge have been faithfully and scientifically done, we still have to do with diseased processes in the outlying area, and that these are now not so much peripheral as they are systemic. The scooped-out area has become the deeply entrenched dumping-ground—a sort of concentric terminus of scavenger and offal trains from all

parts of the body. His conclusions are that nasal polyps recur, first, because the rhinologist does not always trace them to their deeper pathology; second, he often fails to find the seat of their first origin; nor does he differentiate the various stages in their evolution, or the accessory causes of their continuance; third, all the necrotic tissue, therefore, not being recognized and removed, nature's drainage avenues are not re-established; fourth, many cases recur after all surgical measures have been exhausted because too many of the scavenger trains are keeping up the pernicious habit of carrying the wastes of the body to the old dumping-ground. Specimens were exhibited all of which seemed to grow from bones undergoing necrosis; some of them being removed with their bony base. Four were found in the maxillary antrums, 4 formed a part of the middle turbinates, and 3 grew around the antral orifices. The one particularly described and illustrated was found in the sphenoid cavity (Fig. 117). The case was that of a woman, aged 45 years, who had suf-

fered from asthma 6 years and each year bilateral nasal polyps had been removed without much relief. Severe headaches, especially occipital, were marked. Upon examination both nostrils were found packed with polyps. These having been removed and the ethmoidal cells thoroughly curetted, upon entering the last cell with a stout probe to test the condition of its posterior wall, the probe suddenly slipped onward, having entered the sphenoid cavity. The opening was enlarged and a white body which felt soft to the probe could be seen. With a Hartman ear forceps this was removed and found to be a polyp nearly 2 inches in length, vermiform in outline and $\frac{1}{4}$ inch in thickness. The patient was soon relieved of all the more distressing symptoms of asthma and has had no evidence of recurrence for 6 months.

DISEASES OF THE TONSILS.

The Faucial Tonsils: The Indications for Their Removal and the Best Methods by which to Accomplish It.—Francis R. Packard¹ discusses the causes which lead to the overdevelopment of the faucial tonsils. "Several reasons besides hypertrophy may render it necessary to remove the tonsils: (1) They may constitute a locus minoris resistentiæ, the openings in the crypts on the surface of the tonsil affording lodgment to various germs, especially those of diphtheria and scarlet fever. (2) Cyst-formation is not infrequent. (3) There may be an accumulation of cheesy material in the crypts. (4) Tumors, principally sarcomas, are not uncommon." The article deals only with the removal of the tonsils because of their hypertrophy. Operative measures are the only really effective means. "The causes readily divide themselves into very distinct classes: those in which the patient is young, before the age of puberty, and those of more mature years. In children the tonsil tissue is soft and not very vascular, and the removal is not attended by very much subsequent pain; in adults the tissue is usually the seat of inflammatory troubles, there is considerable vascularity, and the tissues being more dense and harder to cut, the subsequent pain is more severe." Most operators prefer to use the tonsil guillotine. Where the patient will cooperate, it is much easier to operate under local anesthesia. For children and nervous patients a general anesthetic is necessary, as a rule. Although serious hemorrhage has occurred subsequent to tonsillectomy, there have been few, if any, deaths directly attributable to it, except in hemophiliac patients.

The Controlling of Hemorrhage after Tonsillectomy.—Hermann² reports a case of a man of 46 in whom severe hemorrhage followed removal of the tonsil. After all the usual methods of checking the hemorrhage had failed, silk ligatures were passed through the anterior and posterior faucial pillars and tied. The hemorrhage was immediately checked and there was no subsequent distress. E. Escat³ reports a more serious case of the same trouble. The hemorrhage was at first slight,

¹ Internat. Clinics, iii, twelfth series, 1902. ² Arch. f. Laryng., xii, No. 111.

³ Rev. Hebdom. de Laryngol., d'Otol., et de Rhinol., Sept., 1902.

was not controlled by gargling with cold water, and continued for about 15 minutes. Inspection revealed a jet of arterial blood at the upper part of the stump. A tampon of cotton-wool was pressed against the bleeding point by means of forceps, but was ineffectual. The application of the galvanocautery only served to increase the hemorrhage. An attempt then made to seize the artery with hemostatic forceps was ineffectual. A tampon of cotton-wool held between the middle and index fingers was then pressed against the bleeding point for 10 minutes; this held the hemorrhage in check, but it recurred as soon as the tampon was removed. Various hemostatics, including ice and iron perchlorid, also proved ineffectual. Ricord's compressor was then applied and arrested the hemorrhage, but it caused so much pain that it had to be removed and the bleeding was worse than before. By means of a staphylorrhaphy needle-holder a large curved needle carrying a silk thread was carried through both pillars of the fauces by one movement and the suture tied. This proving insufficient, a similar suture was passed 2 cm. below the first. This closed the cavity, but the hemorrhage still continued. A clot then formed, and as the hemorrhage seemed to be stopping, gelatin was injected into the cavity; but this only served to increase the hemorrhage. Finally, a cylindric tampon of cotton-wool the size of the little finger was passed from above the upper suture into the cavity and carried downward until it appeared below the lower suture. The hemorrhage, which had lasted for 4 hours, was permanently arrested, and at the end of 24 hours the sutures and tampon were removed with no recurrence of the bleeding.

Death from the Bursting of a Tonsillar Abscess.—A. Lyons¹ reports a case of a man of 28, who was admitted to the hospital suffering with a very large suppurative tonsillitis on the left side. After a warm bath he was put to bed and given a glass of milk. Half an hour afterward a nurse in charge heard him coughing feebly and on investigating found him cyanosed. Lyons was sent for and arrived in 5 or 6 minutes only to find the patient dead. Autopsy showed that the abscess had burst and that a large quantity of pus had gotten into the upper part of the larynx.

New Instruments for the Removal of the Faucial Tonsils.—Charles M. Robertson² describes a knife and scissors for the purpose of complete removal of the faucial tonsils. The knife is a double-edged bistoury, curved on the flat, with a radius of 1 cm., a cutting edge of 2 cm., and with a dull point. The scissors are made in two sizes, for adults and children, and are made rights and lefts. The advantages claimed for the scissors are: (1) They allow of the removal of every part of the gland, or any portion of it, as the operator may choose. (2) They are bent on the long axis so that when fitted into place the handles are horizontal. (3) They are made with a double joint so that the cutting edges can be thrown wide apart, with little movement of the handles, allowing the operation to be done in cases in which the jaws cannot be widely separated. (4) The blades are curved enough to make it unnecessary to turn

¹ *Lancet*, Sept. 20, 1902.

² *Jour. Am. Med. Assoc.*, Nov. 1, 1902.

the scissors on their long axis, in cutting the lower portion of the gland. (5) They enable the removal of small diseased tonsils which it is im-

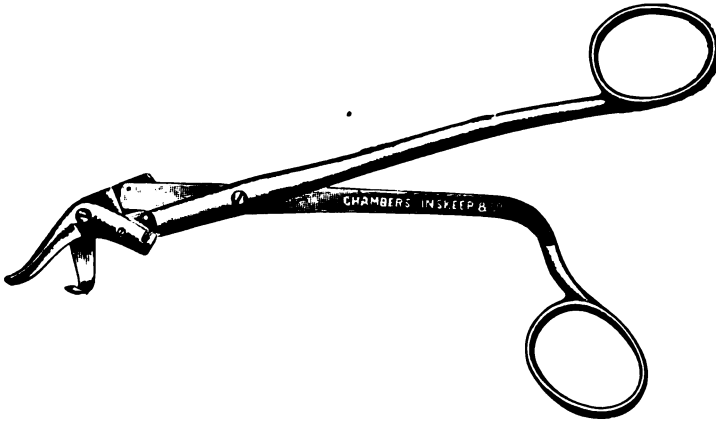


Fig. 118.—Robertson's scissors (*Jour. Am. Med. Assoc.*, Nov. 1, 1902).



Fig. 119.—Robertson's knife (*Jour. Am. Med. Assoc.*, Nov. 1, 1902).

possible to remove with the tonsillotome. (6) The operator is enabled to remove the entire gland with no injury to the pillars. (7) There is not the soreness following the operation that is so common in the use of the galvanocautery, and ear complications are not so liable to occur.

A Modification of Farlow's Tonsil Punch.—Emil Amberg¹ describes a modification of Far-

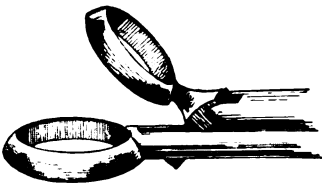


Fig. 120.—Amberg's modification of Farlow's tonsil punch.

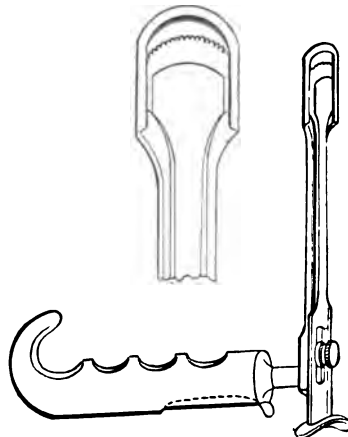


Fig. 121.—W. Stuart-Low's anatomic tonsillotome.

low's instrument in which the jaws are oval instead of round (Fig. 120). The advantage claimed for the oval shape is that when the space is

¹ The Phys. and Surgeon, Aug., 1902.

limited the blades can be employed to greater advantage than can those which are round.

The Anatomic Tonsillotome.—W. Stuart-Low¹ describes this instrument and claims that by its use the hypertrophied tonsil can be much more completely excised and not merely clipped (Fig. 121). Another advantage is that on account of the shape of the opening the lower part of the tonsil is removed. The serration of the blade has a marked effect in lessening hemorrhage, especially in adults, as the tonsil is lacerated rather than sharply cut. A third feature is that the handle is not only massive and molded to fit the fingers and the thumb, but is prolonged into a hook at the end. The advantage of this is that the operator, by using the ulnar side of the hand, has increased power for outward leverage and can thus press the blade well over the base of the tonsil before driving it home.

The Tonsilsector.—A. B. Francis² describes this instrument. The advantages claimed are that it avoids the risk of wounding large vessels

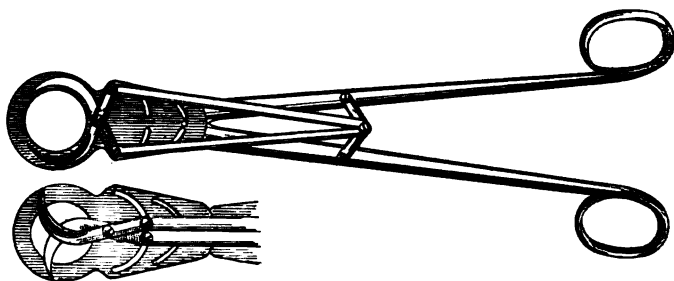


Fig. 122.—Francis's tonsilsector.

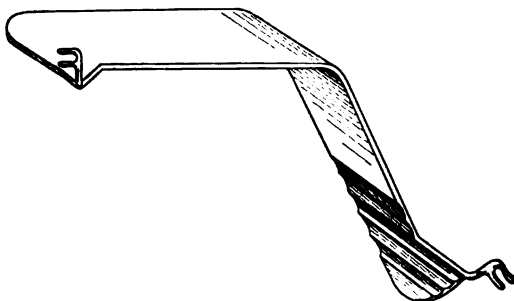


Fig. 123.—Baber's tongue-depressor for exposing the tonsil.

incident to the use of the probe-pointed bistoury, and that it can be used by one hand, leaving the other free. It consists essentially of a pair of circular scissor-blades moving inside a circular guarding ring (Fig. 122).

A Tongue-depressor for Exposing the Tonsil.—C. Baber³ describes a modification of Jaenick's instrument (Fig. 123). It consists of an angu-

¹ Lancet, July 5, 1902.

² Lancet, May 2, 1903.

³ Brit. Med. Jour., April 25, 1903.

lar depressor having on one side a small double blunt hook fixed at right angles to the blade. It is reversible and by having a hook attached to both blades can be used for either tonsil. By engaging the hook in the anterior pillar or in the plica triangularis and drawing it forward and outward the surface of the tonsil and the opening of the supratonsillar fossa can be fully exposed.

DISEASES OF THE PHARYNX.

Lithemic Nasopharyngitis and other Manifestations of Systemic Disturbances.—J. A. Stucky,¹ in a paper read before the American Laryngological, Rhinological, and Otological Society, said that considering the pharynx more especially a portion of the alimentary tract, rather than of the respiratory tract, we can readily understand how it might be influenced by the lithemic diathesis, as this has its origin in the faulty metabolism occurring in the liver, or perhaps just as often to autointoxication caused by the absorption of by-products from the intestinal tract. He states that of the recent leading text-books on laryngology and rhinology consulted, the views of Kyle more nearly corroborate the clinical features in his observations than any other. He further defines the condition as an acute inflammatory or congestive process caused by acid urates which have not been eliminated through the proper channels. The excess being distributed to the structures specially concerned in secretion and elimination, irritation of the superficial structures follows; marked vascularity of the pharynx renders it particularly susceptible, the position making it more disagreeable to the patient because of the use of the muscles in swallowing. The local manifestations of the diathesis may not be confined to the pharynx alone, but may also be manifested in affections of the laryngeal, nasal, and gastrointestinal tracts, without other constitutional symptoms. There may be no distinct pathologic alteration, this being a local manifestation of a systemic condition. The attack may come on gradually with slight tendency to headaches, pain in muscles, especially the neck, or it may be ushered in suddenly without apparent cause known to the patient; when the latter is the case, the first symptom noticed is sensation of fulness and accumulation in the throat, which is increased by swallowing, attended with much discomfort, the throat having a rigid, stiff feeling, hot, dry, and irritated. The systemic disturbances, as indicated by the temperature, pulse, and inflammatory condition, are not sufficient to account for the pain and discomfort. The primary cause of lithemic pharyngitis, as well as many cases of spasmodic rhinitis or vasomotor coryza, is internal, and the exciting factor in precipitating the acute attack is not more frequently exposure to cold than to overindulgence in eating and drinking. This fact is noticeable since, as a rule, the cases are overfed and underworked and lead a sedentary life. A starving man neither takes cold nor suffers from lithemic or rheumatic trouble. Under treatment he directs attention to the systemic condition instead

¹ Trans. Amer. Laryngol., Rhinol. and Otol. Soc., 1902.

of local. The production of increased metabolism by stimulating the liver and regulating the action of the bowels, also the diet and habits of the patient, not only will prevent the further formation and retention of uric acid in excess, but will check the autointoxication from the intestinal canal. The drugs indicated are those that will hyperalkalinize the blood and increase its solvency for urates. Subalkalinity of the blood indicates diminished oxidation and consequently retarded nutrition, both being favorable to the formation of uric acid in the body, as well as to the growth of pathologic microorganisms, which favor autointoxication. Attention to the best hygienic principles, both with reference to the care of the body and daily surroundings, is emphasized.

Cancer of the Tonsil, Pharynx, and Adjacent Parts.—G. Bendandi¹ reports 5 cases upon which he had operated. He states that primary cancer of the tonsils spreading to adjoining parts is rare, while it is fairly common to see the condition arise in the pharynx and spread to the tonsil, soft palate, tongue, and esophagus. In the author's cases the anterior pillars of the fauces were involved, thus giving additional space. The following method of operating was adopted: The patient's head was extended as far as possible and Kocher's incision made in the geniomastoid region. The tongue was then amputated and the incision prolonged downward along the anterior margin of the sternomastoid if the condition showed that the glands were infiltrated in that direction or that the disease involved the laryngopharynx. The skin, superficial fascia, and platysma were raised, the superficial veins and the facial artery tied, and the flap thus formed turned up and sutured to the zygoma. The mandible was then cut at the level of the last false molar, disarticulated without opening into the mouth, and resected. The lymph-glands and connective tissue in the carotid groove and submaxillary fossa were then removed. If the base of the tongue was then found to be involved, the lingual artery was tied, and if it was found to extend to the lower portion of the pharynx, the superior thyroid artery was tied. The pharynx having been reached, the cancer was palpated, the mouth opened, and the tumor removed by means of the Paquelin cautery. After removal healthy tissues were sutured to the angles of the wound; there was practically no deformity, and good ability to masticate remained. In those cases in which the condition was so far advanced that extirpation was impossible and the necessity for relief imperative, tracheotomy was performed; and in some cases in which the pharynx was blocked, a very low esophagotomy was resorted to. In the 5 cases reported the growth was totally excised. In one there was favorable progress for 3 years, but death finally resulted from recurrence; in the second the patient died 5 days after operation, from cerebral hemorrhage; in the third the result is unknown because the patient did not return after being discharged apparently cured; in the fourth the result was apparently favorable, but in 3 years there was recurrence; and in the fifth recovery was perfect, with no recurrence.

Keratosiis of the Pharynx.—C. W. Richardson² presents an ex-

¹ *Rif. Med.*, Feb. 18, 1903.

² *Am. Jour. Med. Sci.*, Oct., 1902.

haustive paper on this subject. He takes the position, with Seibenmann, Brown-Kelly, Friedland, and Kyle, that there is a condition in the pharynx which is a true keratosis, is entirely independent of the lepto-thrix, and is often described as a pharyngomycosis. The disease occurs in several forms, the variation being due in part to the location of the deposit and the age of the process. There may be minute pinpoint-like, intensely white spots on a level with the mucous membrane of which they seem to form a part; there may be broad, plaque-like, white masses projecting above the surface of the mucous membrane and seen most frequently on the pillars and lateral walls of the pharynx; or they may be found as conical or triangle-like horny projections from the mucous membrane protruding from 2 mm. to 8 mm. above its surface. This last form is most frequently found on the faucial and lingual tonsils and the epiglottis, and is the most frequent and most characteristic lesion of the disease. The tufts are small, tough to horny in consistence, and are firmly adherent to the mucosa, from which they can be separated with difficulty, and when separated do not undergo disintegration; after being forcibly removed they are rapidly reproduced, while new tufts are slow in growth. The firmest, hardest, and most elongated tufts are found at the base of the tongue and the crypts of the tonsils. Those located around the isthmus of the fauces are frequently found to be surrounded with a soft pultaceous substance, which is usually absent from those found at the base of the tongue and the pharynx. The most frequent seat of the disease is Waldeyer's ring, and frequently the tonsil will be found studded with a half dozen or more distinct tufts, while between the pillars and the tonsil and at the upper fornix will be found a continued chain, making almost a continuous white line. They are often found at the base of the tongue and in typical form, and also on the glossoepiglottic folds and in the corresponding fossas. They have also been observed in the larynx, on the pharyngeal tonsil, in the nasal chamber, on the conjunctiva at the inner canthus, and in one case pervaded the whole upper air-tract. While they are stated to vary in color from white to yellow, in all the cases seen by Richardson the spots had a distinctly pearly, clear white appearance. The disease usually occurs in those of early adult life, of robust constitution, and unassociated with any constitutional disorders. It is most frequently found in the female sex, and heredity, occupation, and general environment seem to have no etiologic influence. Most of the cases occur in the well-to-do; climatic conditions and season seem to have no effect. It is possible that local morbid changes in the tonsil affect the production or the course of the disease. The symptoms complained of are a sensation of scratching, pricking, or stiffness about the region of the fauces, more or less difficulty in swallowing, the sensation of the presence of a foreign body, more or less hawking or cough, and vocal fatigue. The disease sometimes shows a tendency to spontaneous resolution, which may occur in from a few months to several years. In studying the pathology of this condition unsuccessful attempts at inoculation have been made. Seibenmann's investigations showed the masses to be made up of a central narrow

lumen containing bacteria, detritus, and mucus surrounded by an epithelial wall composed partly of layers of hardened, unnucleated epithelial cells and partially of a homogeneous horny substance; on the outer surface of the quills which projected from the crypts were bundles of leptothrix, and in the neighborhood there was absence of every evidence of inflammation. His conclusion was that the process is an unusually intense cornification of the lacunar epithelium which terminates in quill-formation and that the presence of the leptothrix was incidental only. On account of the discovery of subepithelial buds and the absolute demonstration of the epithelial formation of the quill, which show the manifestation of spores only on the outer surface, Seibenmann considers the question settled, and considers that the name of the condition should be changed to "hyperkeratosis lacunaris." Kelly agrees with Seibenmann and holds that the disease known as mycosis leptothricia is really a keratosis, that it is more extensive than Seibenmann describes, and suggests the more adequate term of "keratosis pharyngea." He describes leptothrix filaments in the center of the masses removed from the tonsils and tongue also as present in smaller numbers than those obtained from the pharyngeal wall and entirely absent in the excrescences taken from the nasopharynx. He also describes the excrescences removed from the nasopharynx as being identical in their histologic characters with those removed from the tonsils and pharynx. It is found that the leptothrix deposit is most pronounced where the greatest abundance of epithelial cells exists, and this fact, independent of the histologic change, is the strongest point in favor of the nonleptothricial origin of the disease. Another point is the apparent subepithelial origin of the keratoid masses. Kyle has demonstrated, along this line, the presence of a peculiar fibrous band which, extending from the subepithelial structures, penetrates and obliterates the basement membrane, extends out over the epithelial surface, and maintains its connection with the subepithelial structures from which it obtains its nutritive supply. The conclusion seems justifiable that there is a keratosis of the faucial and pharyngeal mucous membrane in the condition commonly called pharyngomycosis, and it is probable that the changes begin in subepithelial tissue. There seems to be no doubt that the change is identical whether it appears in the nasopharynx, oropharynx, or fauces, and that the leptothrix is not a constant factor, but accidental and bearing no causative relation to the structural changes. It is probable that there is a condition occurring in the pharynx of the young and the aged which is attended with the presence of the leptothrix and is a true mycosis.

Acute Gout of the Pharynx.—M. Lermoyez and G. Gassne¹ describe a case in which a sudden, violent sore-throat, lasting several days, with inflammation simulating peritonsillar abscess, suddenly subsided into a first attack of typical gout in the great toe of the opposite side. Manifestations of true gout can be differentiated from periamygdalitis by their sudden onset, acute evolution, instantaneous subsidence, violent fever, intense local pain altogether disproportionate to the apparent lesion, the

¹ Ann. des Mal. de l'Oreille, du Larynx, etc., May, 1902.

tendency of the inflammation to extend to all portions of the pharynx, the fluxionary character of the lesions which give the throat a somber red color, the edematous aspects, the absence of exudation, and the non-involvement of the submaxillary glands.

Primary Epithelioma of the Uvula and Soft Palate and Treatment with the Röntgen Rays: Report of a Case.—J. F. McCaw¹ reports a case of great interest. His patient was a woman of 37, a housewife, with a negative family history. There were slight irritation and soreness of the throat 8 months previous to examination, and soon two or three small ulcerated surfaces were noticed on the soft palate which seemed to improve under treatment by the family physician. About 6 weeks before McCaw saw her the soft palate at the site of these ulcerations began to enlarge rapidly; this was soon followed by dysphagia pain which was worse at night, muffled intonation, and soreness in the cervical muscles of the left side. Examination revealed a mass involving the uvula, soft palate, both posterior faucial pillars, the right lateral wall, and a portion of the posterior wall of the pharynx. It was of irregular, nodulated outline, had an ulcerated and necrotic surface, and was dense and almost cartilaginous in consistency. There were stiffness and soreness of the neck-muscles, but no glandular involvement. There had been some loss of flesh, but the patient's general condition was good. Examination of a small excised portion proved it to be an epithelioma. Under ether as much as possible of the growth was excised from the soft palate and posterior pillars with the electrocautery knife and the ulcerated areas on the pharyngeal wall vigorously curetted and thoroughly cauterized. At the end of 4 or 5 days the eschars began to separate and cicatrization to appear. After the lapse of 2 weeks, when the reaction following the operation subsided, the application of the Röntgen rays was begun. A double anode, extra large improved German tube of moderate vacuum was used, excited by a static current from a machine composed of eight 30-inch revolving plates run as rapidly as safety would permit. For the purpose of protection the lower part of the face, the inside of the mouth, and the tongue were covered with a specially devised apparatus composed of sheets of block tin. The tube was adjusted as close to the mouth as possible, while the upper part of the face was covered with a sheet of heavy tin-foil, in spite of which there was some tanning of the nose and forehead and a slight conjunctivitis. The treatments were given 3 times a week for 7 weeks and varied in length from 10 to 15 minutes. At the end of the first week the soreness was almost entirely gone, and at the end of the second the healthy part of the fauces began to show more redness and a network of veins could be seen where the most direct rays came in contact with the mucous membrane. The diseased areas were in a condition of healthy cicatrization, and the only unpleasant symptoms complained of were a peculiar smarting in the throat and the feeling of dizziness and fulness in the head which followed treatment and kept her awake most of the night. At the end of 5 weeks a direct inspection showed that the throat was entirely healed, but examination with the

¹ N. Y. Med. Jour., Aug. 9, 1902.

mirror revealed an unhealed area on the upper surface of the soft palate. The rays were directed against the palate and healing was much slower than when the diseased parts were in the immediate path of the rays. At the end of 7 weeks only one small pea-sized area was unhealed. The patient stopped treatment for 3 weeks, at the end of which time there was marked increase of the ulceration and infiltration of the palate with extension to the right lateral and posterior pharyngeal wall. Under chloroform this growth was curetted and cauterized with the electric cautery, and a portion of the growth on examination confirmed the previous diagnosis. In this specimen, unlike the first, there was evidence of very rapid colloid degeneration of the epithelial cells. Treatment with the Röntgen rays was continued for 5 weeks, 3 times a week, with 20-minute seances, and following that once a week. The last examination of the patient showed that the ulcerated surfaces were entirely healed, the amount of scar-tissue almost unnoticeable, and the slight degree of contraction of the velum that had been present had disappeared. There was nowhere to be seen any evidence of further infiltration.

Direct Endoscopy of the Upper Air-passages and Esophagus; Its Diagnostic and Therapeutic Value in the Search for and Removal of Foreign Bodies.—Gustave Killian¹ demonstrates the advantages of a wider application of Kirstein's autoscope to the extent of obtaining a direct view of the air-passages and esophagus without injuring them. He claims that neither the olive-shaped bougie nor the skiagraph is invariably reliable, because in the case of a foreign body in the anterior wall of the esophagus the former may slip past it along the posterior wall, while in using the latter the shadow of the foreign body may be obscured by the shadow of the vertebrae or heart, or be absent entirely. In using direct esophagoscopy cocaine-anesthesia is frequently sufficient, while in children and nervous individuals general anesthesia may be necessary. The head is thrown backward and the tongue and epiglottis drawn forward by a Kirstein spatula, while the parts are illuminated by the headlight; when a general anesthetic has been administered in children, the head should be drawn over the end of the table. In removing foreign bodies from the trachea Killian uses a straight tube sufficiently wide and long to pass through the glottis, and by this means is independent of the pharyngeal and laryngeal reflexes, and foreign bodies are readily discovered and extracted. When tracheotomy has been required and the foreign body not ejected, a short, straight tube can be inserted through the wound, the trachea cocaineized, and the bronchi inspected. For this purpose and method of extracting foreign bodies a good view, great care, and stillness of the patient are necessary; the most valuable instruments are slender tubular forceps and blunt hooks. Of 15 cases with operation for the removal of foreign bodies from the bronchi by the aid of bronchoscopy, 13 were successful and 2 unsuccessful. In only 1 of the 13 was there a subsequent fatal result, death occurring in this case 9 months afterward from empyema upon the healthy side.

Acute General Infections Originating in the Lymphoid Tissue

¹ Jour. Lar., Rhin., and Otol., Sept., 1902.

of the Upper Air-tract.—Discussion at the twenty-fourth Annual Congress of the American Laryngological Association.¹ J. L. Goodale, in reviewing the **pathology of the tonsil**, stated that finely divided substances in the crypts of the tonsil can enter the tonsils proper through the interfollicular lymph-spaces. He found a complete absence of bacteria in the tonsillar tissue proper, although there might be large numbers of them in the crypts. He disagreed with the common statement that the leukocytes found in the tonsils are phagocytes, and does not regard the tonsils as protective organs in the sense of themselves producing phagocytic leukocytes, but rather as affording open channels along which polynuclear leukocytes pass from the bloodvessels over the surface of the mucous membrane. The number of leukocytes in the crypts is found to depend directly upon the presence of substances with positive chemotaxic properties. Acute infecting bacteria multiply in the proper tonsillar tissue only after penetration into the centers of the follicles has been effected. If the interfollicular abscesses discharge into the veins, the conditions are favorable to the development of a general septicemic condition.

H. L. Swain, in discussing the **symptoms and treatment of tonsillar infection**, emphasized the fact that this region is an active portion of the lymphatic system. Lymph-nodes are normally places of detention where cells are quarantined and the lymph cleansed. The fact that the profound constitutional disturbance is associated with acute inflammation of this part of the lymphatic system is explained by the more direct connection of the faucial and pharyngeal tonsil with the lymphatic trunks and by their much greater mass. The tonsils are now conceived to be the point of entrance of the germs causing acute articular rheumatism, and in one of his cases acute Hodgkin's disease and lymphadenoma had originated from the tonsil. In very young children inflammation of the third tonsil predominated, and in those from 3 to 6 years of age results of inflammation of the tonsil were likely to be lasting. Frequently such an attack will begin with fever and with practically no local symptoms except slight nasal stoppage. After a few days of fever, headache, and foul breath the attack often passed off, the examinations of the physician having revealed nothing. Or, perhaps in a few days the neck would swell, the child would become decidedly ill, and the diagnosis of lymphadenitis made. The interest in these cases lies in the absence of marked local manifestations; but even in young children it is usually possible, by spraying the nose with weak cocaine solution, to inspect and accurately estimate the condition and size of the pharyngeal tonsils. Friedländer has reported that in 133 autopsies at the New York Foundling Hospital tuberculous lymph-nodes were found in the chest in every case irrespective of the cause of death, and infection was believed to have originated in the tonsils. The tonsils should be looked upon as being just as normal as any other lymph-node, but if infected or otherwise abnormal, they should be removed. In the treatment of inflammations of the pharyngeal tonsil the instillation of boric acid and suprarenal solution is of value.

¹ Med. Rec., July, 19, 1902.

as both opening up the passages and cleansing them. A weak solution of hydrogen dioxid is sometimes beneficial, but prolonged use is likely to be followed by irritation, and its use should in every instance be followed by an alkaline spray or wash.

E. L. Shurly stated his belief that the tonsils had an important **physiologic function** in assisting the fermentation of food lodged there and in the destruction of saprophytic organisms located there.

As regards the **normal size** of the tonsil, R. C. Myles stated that it represented from 30 to 60 cu. mm.

C. C. Rice **deprecated the use** of such **astringent applications** to the inflamed tonsil as silver nitrate because they aided inward progress of infection, preferring soothing disinfectants and relaxing gargles.

W. E. Casselberry suggested, in treating young children, that the **medicine dropper should be substituted for the spray**, as the instantaneous propulsion of a little fluid with the dropper was quite effective and could be more readily used. For the purpose of diagnosis he advised using a solution of cocain as weak as 0.1 %.

Samuel Johnston advised commencing the **treatment** by a calomel purge followed by citrate of magnesia. As a gargle he suggested dissolving in a tumbler of hot water a saltspoonful of the powder composed of 2½ drams (10.0) each of the biborate, bicarbonate, and salicylate of soda, 4 grains (0.24) of carbolic acid, and 4 minims (0.24) of oil of cassia, to be used every half hour or hour. Cases of acute follicular tonsillitis usually succumb to this disease in 3 days.

W. K. Simpson stated that acute follicular tonsillitis was self-limited and practically unaffected by treatment.

Emil Mayer deprecated the introduction of the finger into the nasopharynx either for curetting or for diagnostic purposes, stating that the presence of adenoid tissue on the posterior wall of the pharynx was almost positive evidence of adenoid tissue in the nasopharynx.

E. Fletcher Ingals believed it **possible to abort acute follicular tonsillitis** by the application of a solution of equal parts of guaiacol and oil. The severe burning lasts for about half a minute and is then usually followed by complete relief from pain, which lasts for many hours. This method of treatment aborts about three-fourths of the cases, and even after the disease has existed for 3 or 4 days is worthy of trial.

Tumor of the Pharynx; an Accessory Thyroid Gland; Removal Followed by Myxedema.—E. L. Shurly¹ reports a case of a girl of 16, apparently well nourished and with normal thyroid gland. Attached at the base of the tongue, near the epiglottis and a little to the right of the median line, was a tumor about the size of a hen's egg, which was diagnosed as adenoma. It was removed under chloroform by means of a snare and the operation was followed by rather persistent hemorrhage. Subsequently she returned with well-marked myxedema and was put upon thyroid extract, 5 grains (0.3 gm.) three times daily. Of about 25 cases of accessory thyroid of the tongue or pharynx reported by American surgeons, in all there has been an absence of serious subse-

¹ Med. Rec., July 19, 1902.

quent subjective or objective symptoms and myxedema had been noted only rarely after removal.

An Outbreak of Septic Sore Throat Caused by Milk.—W. Gifford Nash¹ reports the occurrence of 42 cases, occurring in 22 families, of cases of sore throat, cultures from which showed the presence of staphylococci and *Streptococcus brevis*. The disease is characterized by a large amount of swelling of the tonsils, fauces, palate, uvula, and, in many cases, the pharynx. The affected areas were bright red in color and on the tonsils there were present numerous patches of exudation. In a number of the cases there were distinct points of ulceration on the tonsils and fauces which gave rise to considerable dysphagia. The tongue was dirty, and in some instances there were associated gastrointestinal disturbances. The general symptoms resembled those of influenza, including great weakness, and in many instances the persistence of marked debility for several weeks after the subsidence of the acute symptoms. In one case there was a peritonsillar phlegmon. It was found that all the patients affected obtained their milk from the same dairy, and that those who obtained their milk from other dairies had no such trouble. Investigation of the hygienic conditions of the barns, cowsheds, milk cans, etc., showed that apparently the usual precautions as to cleanliness were observed, although when the farmer was asked what was done with milk from cows with sore udders the answer given was that it was put through the separator, which was supposed to filter the milk and remove tubercle and other disease germs.

DISEASES OF THE LARYNX AND TRACHEA.

Pachydermia and Carcinoma Laryngis.—B. Fränkel² describes the case of a man who came to him in March, 1897, suffering from what seemed to be a simple pachydermia of the pharynx. When again seen in July of the same year, a marked alteration having taken place, a section was removed for examination, which showed a condition closely simulating carcinoma. He then decided to operate and the diseased tissue was removed endolaryngeally. Following this it was found that other operative procedures were necessary in order to remove all the diseased tissue, the last being done in March, 1898, when only granulation-tissue was found. When last seen in 1902, he was found to be perfectly well. The vocal cord removed was cut in series showing the transition from pachydermia to true carcinoma, which was illustrated by drawings. The outline of the basement membrane can be followed through the earlier sections with the epithelium growing gradually thicker, till finally the dividing line is lost and the epithelium is found within the connective tissue. This is of interest, since it commenced as pachydermia, during which stage it was seen before it was a definite tumor and was watched in its development; also in the fact that no recurrence has been observed up to date, a period of 4½ years; and lastly in the complete microscopic examination with its accompanying series of sections.

¹ Lancet, Oct. 18, 1902.

² Arch. f. Laryng., Bd. 13, 1902.

Laryngeal Stenosis.—J. Price-Brown¹ states that stenosis when applied to the larynx implies an amount of constriction within the cavity itself sufficient to interfere with respiration. This interference may or may not be sufficient to endanger life. A very large majority of the cases of laryngeal stenosis which occur are due to conditions arising within the larynx. The minority owe their origin to pressure from without, occasioned by external pathologic conditions. The stenosis may be variable in degree and in duration; the conditions being in some cases temporary, in others permanent, or until relieved by medical or surgical measures. Stenosis of the larynx may be either congenital or acquired. The large majority of cases are of the latter character; while the former or prenatal is exceedingly rare—so rare that in the Museum of the Royal College of Surgeons, London, no specimen can be found. **Congenital stenosis:** Nevertheless, the following forms of this condition may be occasionally found: (1) Congenital syphilitic stenosis, as in the case reported by Fränkel; (2) vestibular stenosis, caused by the pressure of limp and collapsible walls; (3) diaphragmatic or web stenosis. This is the most common variety of this very rare condition. The usual attachment of the prenatal web is between the anterior ends of the vocal cords, and this diaphragm may extend various distances backward, until, as in Sir Felix Semon's case, the passage is almost occluded. The congenital deformities of the posterior commissure are usually in the form of bifurcations or dilations. **Acquired stenosis** may be classed according to its cause, and may be the result of a large number of different pathologic conditions. The situation may be above, between, or beneath the vocal cords, or in two or all three localities combined. Wherever located, respiration becomes involved, and the act of inspiration is usually more affected than expiration. Except in cases of acute spasm, the onset is usually gradual. One characteristic symptom, common to all cases of laryngeal stenosis, is the increase of dyspnea during the hours of sleep, owing to the fact that the cricoarytenoidei postici muscles, the dilators, are withdrawn during that period from the control of the will. While the existence of laryngeal stenosis may be easily diagnosed, to ascertain the nature of the lesion which produces it is sometimes very difficult. If the stenosis arises from contractions or adhesions, this may be discovered by the use of the laryngoscope; but when edema is present, the cause of it is more difficult to ascertain. The principal pathologic conditions which produce laryngeal stenosis are the following: **Neuroses**, acute functional, chronic functional, and organic. Acute functional neurosis is the form of spasm of the cricoarytenoidei lateralis and the arytenoideus and is of frequent occurrence in child life. It is usually caused by inflammatory action in the respiratory tract, or as a reflex from some irritated portion of the alimentary canal. The classical laryngismus stridulus or spasmodic group is of this nature and is rarely fatal. Still, in rickety children, the purely reflex spasm has in some instances proved immediately fatal. Chronic functional neurosis occasioning laryngeal stenosis is a condition of paresis of the recurrent nerve occasioned, it is supposed, by toxic

¹ Ann. of Otol., Rhinol., and Laryngol., Aug., 1902.

influence upon the nerve-centers. Organic neurosis of the larynx occasions stenosis primarily by inducing paralysis of the abductor muscles. That they are more vulnerable to organic nerve-lesion than the adductors is generally conceded, and Semon lays it down as a law that paralysis of the adductor muscle is always secondary to paralysis of the abductor. A contribution to the study of toxic paralysis of the larynx, bearing upon stenosis, is given by Heymann. It is a résumé taken from fifty papers on the subject. Lead-poisoning is responsible for a majority of these cases. There are also instances of paralysis arising from the presence of copper, antimony, phosphorus, arsenic, cannabis indica, atropin, morphin, and alcohol. In nearly all these instances the abductor muscles were in the main affected. **Edema**, acute and chronic: Acute edema of the larynx, although a rare condition, always gives rise to laryngeal stenosis. It is sudden in development, and may be occasioned by fractures of the cartilages, inhalation of irritating vapors, escharotics, etc., and even by sudden variations of circulation and external temperature. Chronic edema of the larynx is usually secondary to some other laryngeal condition, such as the pressure of perichondrial abscess, syphilis, carcinoma, tuberculosis, myxedema, syringomyelia, Bright's disease, phlegmon of peritonsillar tissue, lupus, etc. Pseudomembranous stenosis is of frequent occurrence, usually taking the form of laryngeal diphtheria. Inferior chondritis hypertrophica of Gerhardt, being a condition of subglottic hypertrophy, may be productive of a serious degree of laryngeal stenosis, as likewise may the chronic blennorrhœa of Stoerck, and also that rare disease rhinoscleroma. Leprosy of the larynx is always attended by stenosis. Phineas Abraham reports a case in which the lumen of the glottis was reduced to the size of a duck-quill, necessitating tracheotomy to prolong the life of the patient. Glanders, like syphilis, after destruction of normal intralaryngeal tissue, may produce severe stenosis by the inevitable cicatrization which follows. Gout is reported in several instances to have produced severe stenosis by causing spasms. Benign tumors, when intralaryngeal, sometimes occasion severe and dangerous stenosis. Papillomas are the most frequent, and when multiple the symptoms of stenosis are likely to be severe. This is more frequently the case in children than in adults. It takes a larger growth to produce stenosis in the supraglottic than in the infraglottic region; while tumors situated on the vocal cords are particularly liable to produce spasm and cough. Malignant tumors of the larynx produce stenosis in a similar manner to the benign, but in an aggravated degree, owing to the systemic cachexia and its increased pain. Foreign bodies within the larynx produce stenosis, not only from space limitation, but also from reflex spasm and inflammatory action, which they are likely to induce. Laryngeal stenosis may also arise from external pressure. The most common cause is probably goiter, particularly when the isthmus is materially enlarged. Abscess of the neck, enlarged serofulous glands, and neoplasms in the region of the larynx might also be mentioned as exciting causes.

Rapid Dilation and the Prolonged Use of Intubation-tubes in Stenosis and in Cicatricial Occlusion of the Larynx.—J. Payson

Clark¹ reports 2 interesting and somewhat rare cases of rapid dilation of cicatricial and stenosed larynges. The first was that of a young man with a cicatricial stenosis of the larynx resulting from syphilis, which obliged the wearing of a tracheotomy-tube. The interest of this case lies in the method employed to dilate the stenosis. This consisted in passing female urethral sounds (under general anesthesia) through the tracheal opening and through the stricture. A full-sized intubation-tube was then introduced in the usual way. Unfortunately, after coughing this out one day the patient refused further treatment and the tube had to be reinserted. The second case was one of complete cicatricial occlusion of the larynx following diphtheria in a child 5 years old. The cicatrices in the trachea and larynx were divided or stretched under general anesthesia and an 8-10 intubation-tube introduced. The child wore this tube or the size larger with occasional intermissions for nearly a year. Since its removal, over a year, she has breathed naturally and there has been no recurrence of the stenosis.

Myxoma of the Larynx.—P. Delobel² reports a case interesting on account of the size of the growth and the ease of its removal. It filled the entire space of the glottis and completely concealed the vocal cords even on deep inspiration. Oscillation during respiration seemed to indicate attachment by pedicle, apparently in the region of the arytenoids. This was confirmed during the operation, for the mass was easily separated and extracted with Schroetter's forceps. The postoperative treatment consisted in the application of silver nitrate to the remains of the pedicle and the use of cold gargles and the sucking of ice. All symptoms disappeared within 4 days, and at the end of 2 months no evidence of the growth could be seen.

Hysteric Edema of the Larynx.—Galzin³ describes a case of laryngeal edema coming on suddenly and associated with marked dyspnea, which under inhalations of steam and compound tincture of benzoin improved. The patient was a soldier, aged 21, of neurotic ancestry, with a history of attacks of colic with vomiting and constipation. He had also had swellings of the extremities. No cause for the attack could be found, but on the third day a subaponeurotic swelling appeared on his arm which proved to be an area of congestive edema. This suggested a hysteric origin for the trouble, and this probability was confirmed by the presence of cutaneous dysesthesia and the absence of the knee-jerks and the conjunctival reflex. There were other similar swellings in the body, and at no time was there any fever. The attack was repeated 7 months later without any apparent cause, and recovery was rapid.

Cancer of the Larynx Cured by the X-ray.—W. Scheppegegrell⁴ reports a complete cure of a case of carcinoma of the larynx, in the treatment of which x-rays alone were used. The growth involved the left laryngeal wall and vocal cord. High-tension Tesla coil was employed, and in order to gain penetration a tube with a medium vacuum. The face

¹ Laryngoscope, Nov., 1902.

² Jour. Sci. Med. de Lille, Nov. 15, 1902.

³ Arch. de Méd. et de Pharm. Militaires, Sept., 1902.

⁴ N. Y. Med. Jour., Dec. 6, 1902.

and chest were thoroughly protected, but the neck was freely exposed in order that any involved glands might be influenced by the treatment. At first the anticathode was placed 15 inches from the neck, but this was subsequently reduced to 7. The treatment was daily for a period of 20 days and lasted for 10 minutes at each sitting. The anticathode was brought to a dull red heat and the same degree of vacuum was maintained throughout the course of the treatment. At the end of 3 weeks congestion seemed to be more marked and the tumor was unchanged, but at no time did dermatitis develop, and after the second exposure pain disappeared. About 10 days after the cessation of treatment it was found that the tumor and most of the symptoms had disappeared; treatment thereupon was resumed and carried on for 10 days, by which time the ulceration had healed. The patient was in good condition 3 months later, and the aphonia due to loss of tissue of the left cord had been partly overcome by compensatory overaction of the right cord.

Syphilis of the Larynx.—Charles M. Robertson¹ reviews the symptomatology, diagnosis, and treatment of this condition, and tabulates diagnosis from carcinoma and tubercle as follows:

SYPHILIS.	CARCINOMA.	TUBERCLE.
Pain usually slight.	Pain constant, lancinating.	Pain severe on deglutition.
Attacks any portion of larynx and ulcerates very rapidly.	Attacks any portion of larynx and ulcerates more slowly than syphilis.	Favorite site is the interarytenoid space or the base of the arytenoid cartilages; ulcerates slowly.
Rarely seen in the stage of induration. First evidence usually a clear-cut, deep ulcer.	First appearance is that of a new-growth occupying the laryngeal cavity, no clear-cut ulcer.	Usually the first appearances are small spots of induration which spread rapidly, followed by great edema.
Some induration around the ulcer, but usually very little edema.	The growth fills or encroaches on the laryngeal cavity.	Great edema of the arytenoids.
Ulcer extends deeply, often involving cartilage.	Growth extends in all directions, involving all tissues in its course.	Ulcer extends laterally, but not deeply.
Surface of ulcer covered with mucopurulent secretion and necrotic tissue.	Surface of growth covered by discharge.	Surface of ulcer covered with thick mucopurulent secretion and agglutinated mucus.
Mucous membrane hyperemic and injected.	Mucous membrane hyperemic.	Mucous membrane pale.
Laryngeal stenosis not common till cicatrization occurs.	Laryngeal stenosis common.	Laryngeal stenosis rarely occurs.
General health unimpaired.	Early in the disease no impairment of general health; later a marked cachexia.	Health impaired previous to laryngeal involvement.
Frequently evidences of syphilis in other tissues.	In primary laryngeal carcinoma no other involvement until later in the disease.	Previous and coincident pulmonary trouble common.
Rapidly improves under iodids.	Not influenced by iodids.	Not influenced by iodids.

¹ Jour. Am. Med. Assoc., Jan. 17, 1903.

Subglottic Sarcoma Removed Endolaryngeally with the Galvano-cautery Snare.—J. W. Gleitsmann¹ reports a case of a man of 52, whose occupation necessitated his being constantly in the open air, and who gave the history of pneumonia, moderate drinking, heavy smoking, and negative history of gonorrhea and syphilis. He complained of rather sudden onset of hoarseness on awaking one morning about 4 months previously. He suffered from a severe dry laryngeal cough with occasionally a little hemoptysis. There was no pain, no dysphagia, some slight dyspnea on exertion. He lost 25 pounds and his voice could not be raised above a whisper; otherwise his functions were normal. Laryngoscopic examination, which was easily performed, showed that the larynx was normal except for slight congestion of the cords, both of which moved and approximated sufficiently to produce sound, which, however, was not forthcoming. This was due to the presence of a growth below the cords, which by contact with their lower surface interfered with their vibration sufficiently to prevent voice-production. The tumor filled the larger part of the tracheal lumen, leaving only a small posterior opening for respiration. Its size appeared to be that of a small walnut, and its surface was uneven and its density and compactness considerable. There was no enlargement of the cervical lymph-glands. Its attachment was evidently anterior and at the upper end of the trachea. It was decided to attempt removal through the larynx and the following considerations were borne in mind: (1) The possibility of lateral adhesions, which would make an encircling of the tumor by the snare wire an impossibility. This was eliminated by thorough cocaineization and exploration. (2) The question whether the apparent density extended through the whole tumor mass and the possibility of the separation and falling into the trachea of a fragile portion. (3) The possibility of hemorrhage in spite of the apparent nonvasculature of the growth. (4) The technical difficulty of introducing through the glottis a sufficiently wide loop and carrying it deep enough to slip over the lower surface of the growth. (5) Great care had to be exercised, after the tumor had been strangulated off, that it could be extracted through the glottis without slipping from the snare. Preparations for a tracheotomy were made before the laryngeal operation was done. None of the anticipated possible difficulties was met, and the operation was found to be simple, easy, and completely successful. Several applications of cocaine and adrenalin were made to the larynx and trachea, and a length of shank and a size and shape of the cautery loop necessary were determined. Schech's handle and cannula and iridoplatinum wire were used. The loop was tightened slowly and the tumor extracted without difficulty, the base being immediately thoroughly cauterized. The tumor on examination proved to be partly small and large round-celled sarcoma, partly myxosarcoma, and partly commencing alveolar in structure. A small remaining stump was removed 3 weeks after the original operation and the base again cauterized. Examination 5 months later showed nothing abnormal. The patient's voice was as strong as originally, except for slight huskiness, and the

¹ Med. Rec., July 5, 1902.

laryngeal structures had evidently been entirely uninjured by the two operations and by the presence of the heated wire so close to the under surface of the cords.

An Improved Syringe for Intratracheal Medication.—P. S. Donnellan¹ describes a syringe which consists of a graduated annealed glass barrel of 2 drams (8.0 cc.) capacity. The barrel contains a glass piston with an asbestos plunger at one end and a thumb-ring at the other. At the thumb end of the barrel is a detachable metal collar with rings for the insertion of the index and middle fingers. The cannula is metallic, bent at a right angle, and has an olive-shaped closed tip with four fine lateral openings, the advantage of which is that they prevent too free discharge of the injection material and consequent coughing (Fig. 124).

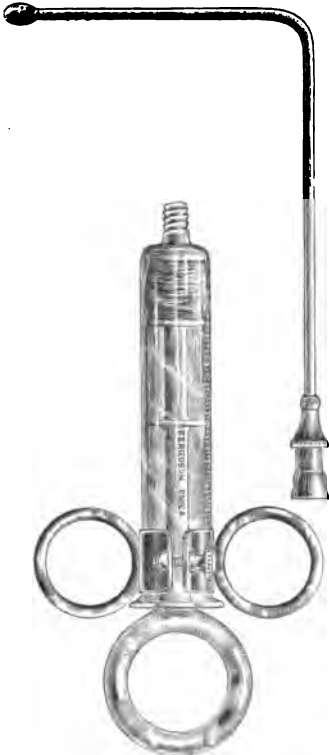


Fig. 124.—Donnellan's syringe for intratracheal medication.

MISCELLANEOUS.

A New Form of Nasal Truss.—W. J. Walsham,² to obviate the difficulty heretofore experienced of the forehead plate of a nasal truss slipping from side to side

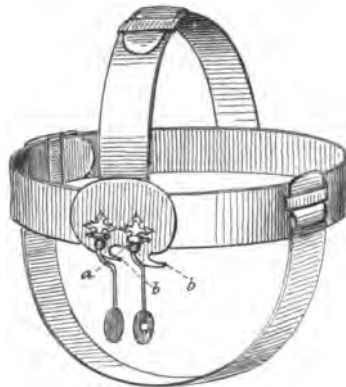


Fig. 125.—Walsham's nasal truss.

and upward over the forehead, has designed the one herein illustrated, making the lower border of the forehead plate follow the contour of the root of the nose and contiguous orbital margins. A rounded notch (A) corresponding with the root of the nose is cut in the plate and the margins of the lower part of the plate forming the sides of the notch are bent backward in a blunt curve (BB), to almost a right angle to the rest of the plate. The notch therefore embraces the

¹ Phila. Med. Jour., Feb. 7, 1903.

² Lancet, Jan. 24, 1903.

root of the nose, while the turned-back portions of the margins of the plates catch under the orbital ridges at the internal angular processes of the orbits. This prevents the truss from being displaced upward, while the notch prevents any movement from side to side. The truss is provided with the usual straps and head-band, and to the plate are fixed the usual arms for making pressure upon, and fixing, the nasal bones or cartilages (see Fig. 125).

Self-retaining Tongue-depressor.—H. P. Mosher¹ describes an apparatus which will retain the tongue in position during operations on the throat. It consists essentially of a spring, one end of which presses on the tongue and the other on the under surface of the chin. It is adjusted and removed on the principle of any spring-clasp. Mosher claims that by having the chin-piece pivoted so that it can catch on the side of the chin it is possible to hold down the edge as well as the center.

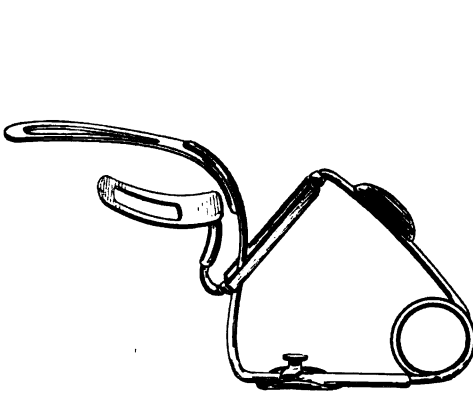


Fig. 126.—Mosher's self-retaining tongue depressor, side view. To open, press on the two finger-plates.

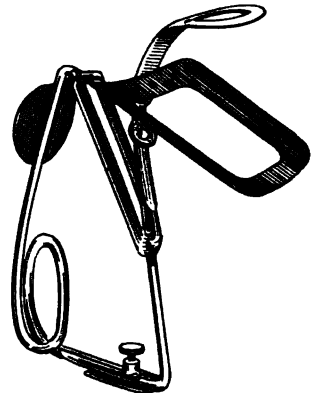


Fig. 127.—Mosher's self-retaining tongue depressor. This cut shows the pivoting of the chin-piece, so that it can be placed at an angle in order to catch on the side of the chin.

The blades are of different sizes and interchangeable (see Figs. 126, 127). [This is an admirable instrument for operations under anesthesia, but is not so practicable for office work.]

Some Points in Rhinologic Terminology.—George Fetterolf² suggests, with a view to the clarification of certain terms and the avoidance of redundancy in others, that the following usage be adopted: "Tonsillectomy" to mean incision into the tonsil and "tonsillectomy" to mean removal of the tonsil, and to be modified by the words partial or complete according to the operation performed. "Turbinate" to apply only to the bone, and the word "epiturbinate" to apply to the soft tissue covering the bone, and the word "panturbinate" to the entire structure, both bone and soft tissue. "Osteoseptum" to indicate the bony portion of the septum, "chondroseptum" the cartilaginous portion, and "panseptum" the entire septum.

¹ Boston M. and S. Jour., Aug. 7, 1902.

² Amer. Med., Oct. 25, 1902.

A Case of Nasal Vertigo Simulating Epilepsy.—Edward Woakes¹ reports the case of a man, aged 40, who came to the Ear Department of the London Hospital with the statement of having frequent "fits," which according to his description seemed to be epileptiform in character. On examination there was marked hypertrophy of the middle turbinated bones, particularly on the right side. On being sent to a general hospital and admitted as a medical patient the nasal condition was dissociated from the symptoms, and the fits, regarded as epileptic, were referred to an attack of sunstroke from which he had suffered 15 years previously. He was treated for 2 weeks as an in-patient, and after being discharged was treated as an out-patient for 7 weeks. The attacks now became more frequent,—almost daily,—his memory became defective, and he wept frequently. It was at this time that he came under the care of Woakes. While the turbinate on the left side showed only slight enlargement, the right presented a firm, nodulated tumor, occupying the anterior ethmoid region of the nostril from its outer wall to the septum. So firmly did it press against the wall that it was impossible to pass the loop of a snare between the apposed surfaces. It was therefore removed by means of the cutting ring forceps, the sections showing expansion of the intertrabecular spaces, but no considerable cyst or cavity. This was in 1896, following which he had not a single attack until July, 1901, when the trouble returned with all the previous symptoms, though somewhat less severe. On examination of the nose the ethmoid region had considerably changed as regards the left middle turbinate, presenting much the same enlargement as that of the right side in 1896. It differed, however, inasmuch as the enlarged osseous structures were covered with abundant soft proliferation, especially on the inner surface adjacent to the septum. The stump of the right turbinate had not materially changed since the operation. He was again admitted to the hospital, and the entire left middle turbinate bone, as well as the stump on the right side, was removed. On the third day following the operation the patient was up, entirely free from symptoms, and returned to his home, since which time he has seemed entirely well. Woakes mentions three symptoms found in this case which he thinks sufficient to differentiate it from one of true epilepsy and to transfer it to the group of vertigos due to disturbance of the equilibrating apparatus of nasal origin—namely, (1) hyperacousis, indicated by the distress occasioned to the patient by the occurrence of loud noises and evidencing implication of the cochlear portion of the octavus nerve; (2) the tendency to uncontrollable weeping; (3) loss of memory.

Clinical Report on the Use of Argyrol (Silver Vitelline) in Diseases of the Nose, Throat, and Ear.—M. D. Lederman² expresses favorable conclusions from the use of this new silver preparation after 5 months of clinical observation. He used it to supplant the ordinary indications for silver nitrate, and also in all forms of acute and chronic inflammatory conditions of the nose, throat, and ear. He used various strengths, from a 3 % to a saturated solution, and found that it possessed the good qualities of silver nitrate without the unpleasant irritating

¹ Lancet, Aug. 16, 1902.

² Med. Rec., Nov. 22, 1902.

features, especially in its application to the nasal, pharyngeal, laryngeal, and aural mucous membranes. In attacks of acute pharyngitis solutions of 30 % and 50 % strength were employed daily for 3 treatments with prompt relief from the dysphagia and a decided change in the engorged tissue, the applications being made with the usual cotton-wrapped applicator. The same effect was noticed in acute tonsillitis and in nasopharyngitis. Two cases of mucous patches of the pharyngeal and tonsillar tissues were treated with a 50 % solution with rapid improvement of the local soreness and disappearance of the lesions within 10 days. In these latter cases internal medication was also used.

To Prevent Nose and Throat Complications in Scarletina.—J. A. Le Sage¹ recommends the intermittent use of the following prescriptions to relieve the purulent rhinitis complicating scarlatina, the result of which is uncertain and rarely remains localized to the nasal mucous membrane:

R. Menthol 0.20 gm. (3 grains)
 Boric acid 4.00 gm. (60 grains)
 Petrolatum 30.00 gm. (1 ounce)
 Mix and make an ointment

Or this:

R. Resorcin 0.30 gm. (4½ grains)
 Petrolatum 30.00 gm. (1 ounce)
 Mix and make an ointment.

Injectations of the following oil are also recommended:

R. Essential oil of mint 11 drops
 Resorcin 1 gm. (15 grains)
 Sterilized olive oil 20 gm. (5 drams)
 M. Ten drops to be injected into each nostril, night and morning.

"Cystoscopy" of the Nasopharynx.—A. Valentin² has adopted a modification of the ordinary cystoscope in the examination of the nasopharynx. The method was suggested by Reichert, who used a small cystoscope to explore the maxillary sinus through an artificial opening. With the modified instrument Valentin states that the walls of the nasopharynx, the posterior nares, and the openings of the eustachian tubes can be inspected with greater accuracy than by the ordinary method. The instrument (salpingoscope) is provided with an electric lamp of low voltage, which is not perceptibly heated by the current. The instrument is readily introduced along the inferior meatus, unless there be marked deformity; and no matter upon which side it is introduced, a distinct view of each lateral wall of the pharynx is obtained by rotating the instrument on its axis.

An Aseptic Cotton-holder.—C. Y. Hogsett³ furnishes an illustration with description of an aseptic cotton-holder, which consists of a leaded metallic base, upon which rests a double metallic cylinder 4 inches in length and 2.5 inches in diameter. Through the center of this passes a square

¹ Union méd. du Canada, Jan., 1903.

² La Sem. méd., Jan. 7, 1903.

³ Med. Rec., April 11, 1903.

steel rod, at one end of which there is a tap, at the other a small crank for turning the rod. The outer cylinder is attached to the metallic base below, is open at both ends, and at its upper part has an opening $1\frac{1}{4}$ inches in width, extending through the entire length. The inner cylinder fits within the outer, is closed at both ends, and has an opening corresponding to that in the outer cylinder. Near the center of one side of the opening there is a small metallic knob by which the inner cylinder can be moved within the outer, thereby completely closing or opening both cylinders. The receptacle for the cotton holds the amount that comes in the smallest sized packages. By inserting one end of the roll of cotton into the opening of the receptacle and then turning the crank the cotton will be wound onto a roll on the central rod just as a bandage is wound on a bandage-roller.

Special Influences of the High Altitudes upon the Nose and Throat.—S. E. Solly¹ makes some observations upon this subject based upon many years' practice in Colorado. The high altitudes are intended to apply to regions above 4500 feet elevation. The belief is expressed that there are marked differences between the climatic influence of a low and that of a high altitude upon the upper respiratory tract; this is due to the diminished air-pressure of the high altitude, lessened humidity, and the increased sensitiveness and energy of the nervous system. These influences are temporary and compensated for in normal persons, but often continue to aggravate or improve pathologic conditions. The subject is treated in some detail, especially in connection with patients coming to high altitudes with partial nasal stenosis.



Fig. 128.—Hogsett's aseptic cotton-holder.

Stammering and Its Treatment by the General Practitioner.—H. W. Langwell² describes at length Wyllie's method of treatment for this condition, claiming that its advantage consists in that it can be easily explained and carried out by the patient's ordinary medical adviser. Stammering is taken to signify both the rapidly recurring enunciation of a particular letter sound and also the tendency to a sudden check in the utterance of certain syllables or letter sounds. As regards the etiology, the condition is more common in boys and is rarely acquired after the second decade; very commonly the period of onset is not when speech is first acquired, but in the later years of childhood. Heredity is of doubtful import, because in such cases imitation of another stammerer is probably the essential factor. Imitation is unquestionably a frequent cause. Some writers ascribe an etiologic factor to debilitating illnesses, and in many cases the condition is worse when the general health is impaired. Another important factor is the nervousness and sense of publicity present in reciting or answering questions in school. The

¹ Abstr. of paper read before the Laryngol. Sect. Am. Med. Assoc., New Orleans, La., May 6, 1903.

² Practitioner, Jan., 1903.

affection is especially apt to occur in those of a sensitive, nervous, or retiring disposition, but in such cases the nervousness is the result rather than the cause. In the cases of those who "stutter" it may frequently be observed that the patient is emptying his chest too rapidly, so that the end of the sentence is often barely audible on account of the deficient volume of air passing through the larynx. In the other variety, those who "silently stick" (Wyllie), there is much less that is audibly noticeable to the bystander, for in many of the less severe cases it is only by looking at the patient that the fact of his stammering can be noticed. It may sound as if the speaker were simply grouping his words peculiarly, whereas his utterance is involuntarily checked at intervals. This variety of stammering produces, as Wyllie puts it, in saying the word "poor," for example, one big initial "capital P," instead of the stutterer's several "little p's." Other symptoms associated with this form are congestion of the face and puffing out of the cheeks in a patient's endeavor to enunciate, which is sometimes finally accomplished with an explosion of saliva as well as of air. In some of the severer varieties there are seen involuntary contractions of the facial muscles and jerking movements of the head or even of the limbs; these last may be so severe that the patient appears exhausted by his endeavors to overcome his difficulties. In addition to these movements there are others of a purposive kind, for it occasionally happens that the impediment is more easily overcome if some other muscles are thrown into play; *e. g.*, by tapping the foot or swaying the body. Another variety of voluntary action, which is sometimes met with, is the enunciation of a difficult word during inspiration instead of expiration, so that the patient really sucks in the word and produces thereby a peculiar see-saw mode of speech. This action is primarily voluntary, although from habit it may finally become involuntary. It is noticed that stammering is more apt to occur upon letters occurring at the beginning than in the middle of a word, that this is most marked when patients are speaking in their ordinary conversational tone, and that it is generally absent when they are singing. In beginning treatment patients should be instructed that in the production of normal speech there are three separate, closely coordinated and interdependent mechanisms: (1) A current of air must be expelled from the lungs by the ordinary expiratory apparatus; (2) this column of air passing through the larynx produces vibration of the vocal cords which results in certain sounds ("vocalization"); and (3) these sounds, initiated in the larynx, are capable of various modifications ("articulation") by the action of the lips, tongue, palate, etc. The important fact for the stammerer to understand is that while the importance of expiratory function is undoubtedly great, his difficulty arises from a want of the proper harmony or prompt cooperation between the functions of vocalization and articulation. Wyllie illustrates this by using as a simile a violin player who with one hand produces the sounds and with the other modifies these into music; vocalization represents the former and articulation the latter part of the performance. The stammerer's error usually lies in the fact that his vocalization is defective both in promptitude and amount, and

he seeks to make up for this by excessive attempts at articulation. The trouble is produced by giving more attention to articulation than to vocalization, and the chief aim in treatment is to emphasize the vocal element in words. The importance of this is seen when it is remembered that scarcely ever does one stammer in singing, because attention is directed to the proper vocalization or the correct sound to be produced, and when speaking or reading in a monotone the predominance of the vocal element will frequently enable a stammerer to overcome his trouble, as in the case of Charles Kingsley, who, though a bad stammerer all his life in ordinary conversation, was enabled to preach well by delivering his addresses in a musical monotone. If in treating a stammerer he is directed to adopt the voice or tone of some one familiar to him, he can get over his most troublesome stumbling-blocks with the greatest ease, because his attention is so directed to the accurate production of the correct sound that articulation becomes as easy as in singing. In those who do not possess this faculty of imitation, this little therapeutic measure cannot, of course, be adopted. After the patient has thoroughly grasped the importance of proper coordination of his vocalization and articulation apparatus, he should be taught how to deal with the various letters of the alphabet, and for the instruction of such Wyllie has constructed the following physiologic alphabet:

A PHYSIOLOGIC ALPHABET.—(*Wyllie.*)

I.—VOWELS.

Y—I E A O U—W.

These should be pronounced in the Latin manner as *ēē*, *eh*, *ah*, *oh*, *ōō*; *y* and *w* are consonants, not vowels, but are placed here for reasons given in the text.

II.—CONSONANTS.

	VOICELESS ORAL.	VOICED ORAL.	VOICED NASAL RESONANTS.
Labials. (First stop-position.)	P (W)	B W	M
Labio-Dentals.	F	V	
Linguo-Dentals.	Th ¹ S	Th ² Z	
Anterior Linguo-Palatals. (Second stop-position.)	Sh T (L)	Zh D L R	N
Posterior Linguo-Palatals. (Third stop-position.)	K H or Ch	G Y (R)	Ng

The voiceless W and voiceless L have been given in brackets, the former being now almost confined to Scotland, the latter being peculiar to Wales. The uvular (burring) R is also in brackets.

The vowels are, of course, produced in the larynx, and therefore generally cause little trouble. The patient should be instructed, however, to give each one its full vocal emphasis, and for this purpose the following sentence is very convenient, as it produces each of the vowels in the physiologic order in which they are produced in the oral mechanism: "Eels ail amid ocean ooze." This does not include the w and y, which are grouped by Wyllie with the vowels. These letters are of great importance, because, when they occur as initials, they are frequently a source of great difficulty, as the patient generally attempts to produce them without vocalizing. An initial w is phonetically equivalent "to a tight *ōō*, with a slight fricative element added," as, for example, in the word "water," which is phonetically "*ōō*-ater." An initial y really represents *ēē*; *e. g.*, the word "yard" really is "*ēē*-ard." The word "yes" is a frequent source of difficulty, partly because it so often stands alone, but mainly because of the attempt to pronounce the initial letter voicelessly as "yeh"; but when once the patient is made to understand that it is equivalent to "*ēē*-es" and that it should be pronounced almost as if one were spelling it into two syllables, he will find it comparatively easy and that he has the key to the enunciation of a large number of troublesome words. Each consonant is considered "as it is pronounced during the enunciation of a syllable containing it"; *e. g.*, the letter F is regarded as the initial sound in the word "far" and not as "eff." The consonants are grouped in Wyllie's alphabet according as they do or do not possess the vocal element, and the important guiding rule is that in speaking or reading all consonants which normally contain voice should have their full vocal element given to them, while those that are normally voiceless should be touched off as lightly as possible, the voice being brought out with emphasis in the ensuing vowel or voiced consonant. For instance, in saying "Tom Davidson" the voiceless T is merely given sufficient compression of the air to supply to the fully sounding "om" the explosive character of the voiceless T, while, since D requires voice, the initial letter must have the voice thrown into it and emphasized. The patient should be thoroughly instructed as to the vital distinction between these two classes of consonants, and must be made to prove to himself the fact. In order to effect familiarity with this distinction it is often useful to give him sentences and tell him to underline in each word the letter in which the voice is first to be thrown, as: "Ask Kate to carry back my Tartan shawl." In case the pupil sticks at a word, the teacher should be able to tell by listening whether the letter is voiced or not, for if he is giving the full vocal element to all the voiced consonants the preliminary laryngeal sound should be audible. With the preceding principles firmly established, the teacher should then go on with the various letters of the physiologic alphabet requiring frequent practice so as to convince the student of the presence or absence of voice. (1) The voiceless oral consonants. The general rule in these is that they should be no more than formed in the oral mechanism, and that all the emphasis should be thrown into the ensuing voice letter. In the early stages of treatment the following method of teaching how such voiceless initials

are to be touched off will be of value: In such a sentence as "Peter caught ten fish," let the student practise emphasizing the voiced portions of the word, viz.: "eter aught en ish." After this is fully produced it is easy to show that the very smallest possible P will convert the "eter" into "Peter"; the same can then be done with the remaining words of the sentence. A practical point as illustrated in the second and third words of the sentence just given is that when the voiceless initial of any word in the sentence is a terminal letter of the immediately preceding word, no attempt should be made to reproduce it again as an initial. The distinction should be taught between the voiceless "th" in "thin" and the voiced "th" in "thine." K represents "C hard" just as S represents "C soft," and hence the absence of the letter itself in the alphabet. (2) Voiced oral consonants. As a general rule all words commencing with two or more consonants are especially likely to cause difficulty, and in this respect those commencing with "wh" are no exception. This difficulty is met by treating the "W" as a vowel and therefore fully vocalized and the "H" placed before the "W," so that "which" is pronounced as if it were phonetically spelt "hoo-ich." The compound letter sound "zh" is the phonetic equivalent of the letter "S" as it is pronounced, for example, in the word "measure." L and R are frequently difficult of pronunciation, and the patient should be taught to vocalize them thoroughly from the full chest. (3) Voiced nasal resonance. M and N are the only ones of these occurring as initials and the patient should be taught to vocalize each as much as possible so that a loud continuous hum is produced. For example, the word "Newmarket" would be spelt phonetically "(un)new" "(um)-market." As regards the rest of the alphabet, capital Q is equivalent to "kw," and X to "ks." Capital J and "soft" capital G are equivalent to "dzh," as in the words "Jim" and "gin." A valuable aid in impressing upon the patient the distinction between the voiceless and voiced letters is the following series of sentences devised by Wyllie:

A.—Initials that contain voice. (In the pronunciation of these the voice is to be thrown boldly into the initial):—

1. "Even ancient elves are awed over oozing."
2. "We visit the Zulus like ramblers yearly."
3. "My nephew."
4. "Best gold dust."

B.—Initials that do not contain voice. (These are to be touched off lightly, the voice being promptly brought out in the ensuing vowel or voiced consonant):—

1. "Far shores seem thinly hazy."
2. "Two poor comrades."

For further exercise upon the more difficult initials the following additional sentences are also reproduced:—

A.—Voiced Initials:—

1. "Billy Button bought a buttered biscuit."
2. "Davy Doldrum dreamt he drove a dragon."
3. "Gaffer Gilpin got a goose and gander."
4. "Mother, make more mustard: no, no, not now."

B.—Voiceless Initials:—

1. "Peter Piper picked a peck of pepper."
2. "Tiptoe Tommy turned a Turk for twopence."
3. "Kimbo Kemball kicked his kinsman's kettle."

The teacher should notice which letters cause the greatest difficulty in reading these sentences and should construct similar ones containing these letters, which should be systematically practised. In all his lessons the patient should stand up and speak in a full voice. He should cultivate the habit of full and regular inspiration in order to have a plentiful supply of air for full vocalization, and should always avoid abrupt or hurried speaking, cultivating deliberate and musical utterance. The daily lesson should consist of reading the sentences given above, then other sentences containing exercises upon the consonants causing the greatest difficulty. This should be followed by a short reading lesson in poetry and subsequently prose. Treatment should be daily and persistent, and the age at which it should commence depends entirely upon the aptitude of the particular patient.

Constitutional Manifestations Due to Infectious Processes in the Adenoid Structures of Children.—D. Braden Kyle¹ states that this structure is known to be readily susceptible to inflammation with which there are usually associated high fever and other constitutional manifestations in children, the slightest infection being accompanied by constitutional symptoms out of proportion to the local changes. When the adenoid tissues are removed there is very little constitutional disturbance even though slight local infection should occur. In those children who are subject to attacks of fever for which no definite cause can be readily found, examination should be instituted for the presence of adenoids, and they will usually be found present. After recovery from the acute infection the adenoids should be removed, and the usual result is the absence of recurrence of the febrile attack and often the rendering of the child less susceptible to the acute infectious diseases.

Spasmodic Torticollis Following an Adenoidectomy.—John M. Ingersoll² reports the case of a well-nourished boy, 7 years old, who had been operated on for adenoids. The operation was complete and in no way unusual. About 3 hours after the operation he developed a typical right-sided torticollis, which was considered to be a reflex neurosis and was treated by suggestion; the spasmodic condition disappeared in a few days. The irritation caused by the operation in the nasopharynx produced reflexly, through the glossopharyngeal and spinal accessory nerves, the spasm of the sternomastoid muscle. Cases of spasmodic torticollis which were cured by an adenoidectomy have been reported. All such cases suggest, at least, the advisability of careful examination for adenoids in patients with spasmodic torticollis, and the possibility of a cure in some cases.

A Case of Defective Speech Due to a Form of Spinal Cord Disease Resembling Disseminated Sclerosis.—G. Hudson Makuen³ reports the case of a patient, 26 years of age, who was apparently healthy until he began to learn to walk, when it was found that his legs and ankles were weak, in consequence of which he was obliged to wear braces for several

¹ Med. News, Aug. 30, 1902.

² Ann. Otol., Rhinol., and Laryngol., Aug., 1902.

³ Proc. Phila. Co. Med. Soc., March 31, 1903.

years. He did not try to talk until he was 4. At the time he applied for treatment for his defective speech respiration was obstructed, owing in part to an ecchondrosis of the nasal septum, but chiefly to his general muscular disability. The septal defect was remedied. A slight intention-tremor was noticeable throughout the entire body, he was awkward in the use of his hands, and wrote with great effort. His walk was unsteady, there was a tendency to drag the feet, and in coming down-stairs his poise was very insecure. He had great difficulty in learning to ride a bicycle, and succeeded only indifferently well; he never could learn to skate or dance. He did not succeed well in school, and his mentality was about on a par with his physical development. He spoke in a halting manner, somewhat as he wrote and walked. There was no stammering, but there was a slight hesitation as if he were thinking how to say the word. Treatment consisted chiefly in the application of various forms of physical training, especial attention being given to development of speech.

The Influence of Catarrhal Diseases of the Nose and Throat in Producing Speech-defects in Children.—G. Hudson Makuen¹ states that catarrhal conditions of the upper respiratory tract interfere with the normal development of speech to an extent that is not fully appreciated, and it is the object of this paper to point out the various ways in which this is brought about. It is generally during the second and third years that these catarrhal affections of the nose and throat do the damage. It is then that the faculty of speech is being acquired, and at this time even the slightest deviation from the normal condition, whether it be in the nasal, pharyngeal, or oral cavity, may be responsible for grave defects of speech. The writer claims that faulty breathing is one of the most common causes of defective speech, and anything that blocks the normal respiratory tract interferes with the normal respiratory rhythm, and brings about a muscle imbalance. He also describes the action of the respiratory muscles in vocalization, and urges the practitioner to look carefully for enlarged tonsils, lingual, faucial, and pharyngeal, and also for obstructions in the nasal passages of all infants.

The Development of the Faculty of Speech.—G. Hudson Makuen² calls speech the tool of the mind, the thing with which the mind works, and draws attention to our dependence upon the faculty of speech, and to the fact that it is acquired by unconscious imitation; and therefore, to have good speech, a child must have good surroundings and good speech models. Important causes of the development of faulty speech are ill health, and the influence of abnormalities of structure on the organs of speech. The first form of expression is crying, which begins at birth. Different crying sounds are soon used to denote special needs. Laughing, smiling, and other forms of facial expression are followed by grunting. Then come babbling and crowing. Soon the child will begin to repeat the last sound of a sentence that it has heard—echolalia. Then comes mimic reading. The child begins to understand spoken language at about 11 months of age, and begins to use words of its own invention. Finally the child acquires intelligent speech.

¹ Internat. Med. Mag., Feb., 1903.

² Internat. Med. Mag., July, 1903.

Congenital Cleft of the Palate. A Further Report upon the Operative Technic and Its Results.—James F. McKernon¹ states that since the publication of his article on this subject in 1899, he has somewhat modified the method, based upon the experience of 24 later operations. In this article he repeats the method as described at that time and adds a few modifications from the standpoint of both operative technic and after-treatment which he finds beneficial. In the first place, on the day before the operation he does a preliminary tracheotomy under cocain-anesthesia, which he finds a comparatively easy matter, since most of his cases were adults. If, however, the patient be a young child, he then advises tracheotomy just prior to beginning work on the palate. In administering the chloroform he prefers to drop it on an inhaler directly over the tracheotomy-tube rather than through a long rubber tube as first described. The large, flat, thick pieces of gauze with strings attached are still used to cover the entrance to the larynx and esophagus as described in the earlier operations. In preparing the edges of the cleft, a long-handled mouse-tooth forceps is used to grasp the edge of the tissue, the cutting being done with long-handled curved scissors, except in cases where the edges cannot be pared with the scissors further than the junction of the hard and soft palate, as here the edge of the cleft is firmly adherent to the palate process of the superior maxillary bone, in which a knife is used, a thin margin of the flap is cut directly down to the bone upon which it rests and can then be easily removed with a periosteal elevator. Especial care is advised to save as much of the tissue of the uvula as possible, which will unite when only a very small area of it is freshened. Before proceeding as in the former operation he now introduces the sutures through both sides of the soft palate, and through as much of the hard palate as overlaps the bone, provided the overlapping be of sufficient width to allow the introduction of the suture; otherwise they are merely passed through to the hard palate. Silver wire is used. After the alveolar incision care should be taken to have that portion of the flap situated just behind the front teeth left with as broad a margin of attachment as possible, in order to preserve the circulation between the flap and the adjacent tissue, since in one instance he observed that the point was narrowed down to a small attachment, and on the sixth day parted, but fortunately closed later by granulation. Where formerly a curved incision was made in the tissue of the soft palate internal to the hamular process, it is now extended downward, keeping well to the outer attachment of the soft palate, until in some cases the incision stops just before the fibers of the pillar are severed, which furnishes an absolute safeguard against tension, and also prevents the arching of the palate after healing has taken place, which is a valuable adjunct when the patient begins to articulate. This incision can be made either before or after suturing the edges, though usually it is partially done prior to suturing; and then, after the edges are united, it is extended downward in the manner referred to. In all of his cases operated upon during the past 2 years he has had little trouble from hemorrhage while operating, and this was easily controlled by gauze

¹ Laryngoscope, Feb., 1903.

sponges wrung out of hot sterile water. Formerly the introduction of the sutures was begun just behind the teeth in the hard palate, but he now inserts them first in the soft palate and then works forward rather than from before backward. In closing the cleft and twisting the wire great care is taken not to draw the sutures too tight, otherwise they may cut through the edges of the flap on the second or third day and allow a separation of the edges. As an aid in drawing the sutures just tight enough to give moderate approximation, a shield is used while twisting the wire, which enables one to see just how tight the suture is drawn. After the wire sutures are in place the ends should all be bent forward to prevent irritation of the tongue as much as possible. The lateral incisions are packed quite firmly with sterile gauze and left in position for at least 24 hours, which tends to push the flaps together and also aids in checking hemorrhage. In all the more recent cases operated upon the second dressing was done from 12 to 15 hours after operation, instead of 24 as was first practised, since the salivary secretion is more profuse after anesthesia and the dressings are saturated quite as much as they are later by allowing them to remain the full 24 hours. The best results he obtained by dressing the whole operative field twice a day for the first 6 days after the primary dressing, the dressings being applied moist, previously wrung out of hot sterile water. In accord with the suggestion that lead clamps would help here and act as splints, he is having some constructed with this end in view. The lateral alveolar incisions should not be packed after the first 24 hours, since even when repacked during the second 24 hours there will be a tendency to a curling over of the edge which has been severed, and this curling takes place toward the median line rather than toward the tissue from which it was severed. Instead of nourishing by the rectum during the whole period of convalescence as formerly advised, he now allows the patient to have a glass of peptonized milk after the third day, while dressing, which is followed by a glass of warm, sterilized water to cleanse the parts. This quantity of nourishment is later increased to a pint of milk at each dressing as the days go on, the rectal nourishment being in no way diminished on this account. In this way, he claims, very little weight is lost and the strength is well maintained. A point in rectal nourishment which he emphasizes is that after the nutritive enema has been placed in the bowel the nurse should always hold a pad firmly over the anus for from 20 minutes to half an hour to prevent its expulsion. The sutures are left in much longer than in his earlier operations, which gives firmer union. The tracheotomy-tube is usually allowed to remain 10 days. In answer to the numerous criticisms which have been made against the use of the tracheotomy-tube, he states that he operated upon 3 cases, those of 2 adults and 1 child 7 years of age, following the technic as described in every detail with the exception of tracheotomy. The results at the end of 5 days were that he had nothing but ragged flaps in the adult cases, and at the end of the second day in the child's case there was not a stitch intact. As regards the final result of the other 24 cases, he states, however, that all were not successful; 16 closed by primary union in both hard and soft palate; in

2 there was a slough at the junction of the hard and soft palate, that looked on the eighth day as though there was going to be a large hole left permanently; but under stimulation these closed completely, though in doing so caused the arch of the soft palate to become somewhat higher than in those which healed by primary union throughout. In 2 cases the wound united by primary union except just behind the front teeth, where a small but permanent sinus was left which was closed 3 months later by a small flap operation. In one case, that of a boy 16 years of age, a large hole was left permanently by the sloughing of the attached end of the flap on the right side next the alveolar border. He believes the reason for this was that the cleft in the hard palate was an unusually wide one, and in trying to close the cleft completely there was an insufficient attachment of the flap on that side with insufficient circulation brought to the flap to nourish the tissue properly. The other 3 cases, those of a child 5 years of age and 2 adults, were almost complete failures. The cause of failure in the child's case he attributes to the child's working the tongue back, and in some way getting it beneath and behind the new palate, thus forcing the dressing out of the mouth and pulling the stitches out of the soft palate. A portion of the hard palate united. In one of the adult cases the failure was ascribed to a secondary hemorrhage occurring on the second day caused by the removal of a large group of adenoids 2 days before the operation on the palate. The bleeding was so profuse that all efforts to stop it failed until packing was done beneath the newly formed palate, and this so disturbed the symmetry of the flap that sloughing followed. Failure in the other case he is unable to attribute to any definite cause, except possibly that of infection, since one of the assistants at the time of the operation was suffering from a suppurating tonsillitis of which the operator was unaware. Of the 24 cases with operation, the ages ranged from 3 to 36 years. From the standpoint of surgical results as well as for the function of speech the author advocates operation at an early age.

DISEASES OF THE EAR.

Functional Tests of Hearing: Some of the Principles on which They Are Based.—William L. Ballenger,¹ emphasizing the great value of functional tests of hearing in the large and oftentimes perplexing group of diseases of the nonsuppurative type which affect the middle ear and labyrinth, states that there is not time within the limits of this paper to enter into a discussion of the relative merits or significance of the various tests, so confines his remarks to certain major principles on which they are based. Under the first major principle he groups two secondary principles which only serve the purpose of elaborating or elucidating it: (1) Anything which disturbs the normal tension of the drumhead and ossicular chain will diminish or abolish the hearing for the two or three lower octaves. (2) Any disease affecting the perception apparatus will diminish or abolish the hearing for the upper tones of the range of hearing. He states

¹ Jour. Am. Med. Assoc., April 11, 1903.

under this heading that the range of hearing in adults under 55 years of age is approximately 16 to 48,000 vibrations per second. After the fiftieth or fifty-fifth year the hearing for the upper tones is somewhat reduced, as has been shown by Zwardemaker, Bezold, and others. The very aged do not, as a rule, hear tones higher than 37,000 vibrations per second. Under the second major principle it is stated that hearing by bone-conduction is approximately one-half as long as hearing by air-conduction. The rule is subject to considerable variation in normal ears, but for practical purposes in the study of these principles we do not need to make a closer analysis. Under this head are also two secondary principles: (1) Hearing by bone-conduction is increased in those affections of the middle ear which disturb the normal tension existing between the drumhead and ossicular chain. (2) Hearing by bone-conduction is diminished or abolished in affections of the labyrinth or perception apparatus. As a third major principle he states that the intensity of hearing by bone-conduction is either increased or diminished by morbid conditions within the middle ear or labyrinth. Two secondary principles may also be given in this connection: (1) Any disturbance of the normal tension existing between the drumhead and ossicular chain will increase the intensity of hearing by bone-conduction. (2) Any disturbance of the perception apparatus will diminish the intensity of hearing by bone-conduction. On these principles he discusses their application in diagnosis and prognosis of cases. After having made a careful history of the case, including all subjective and objective phenomena, the author states that it is his custom in private practice to test the range of hearing with tuning-forks for the lower 7 octaves, and with the Galton whistle for the remaining or higher limit of hearing. If the lower tones are not heard, middle-ear or tubal disease is probably present; and if the upper tones are not heard, there is presumptive evidence of labyrinthine disease. Hence the examination as to the range of hearing is of great value in determining whether the deafness is due to middle-ear or to labyrinthine involvement. An exception to these conclusions is found in those well advanced in years, when the upper tone-limit is normally reduced; and another when there is marked retraction of the drumhead, forcing the foot-plate well into the oval window. The tension of the intralabyrinthine fluid is thereby increased, and may give the usual functional signs of true labyrinthine disease. The signs will quickly disappear, however, on inflation of the tympanic cavity, and thus clear the diagnosis. In the application of the second major principle he gives the following example: If in a given case bone-conduction in the affected ear is relatively longer than hearing by air-conduction, the disease is probably within the middle ear. If the Weber test is performed, the sound will lateralize to the affected side; or if the Rinné test is made, the result will be negative; that is, hearing by bone-conduction will be longer than by air-conduction. If, on the other hand, bone-conduction in the affected side is relatively diminished in duration, it is probably one of labyrinthine involvement. The Weber tests will lateralize to the good or better ear rather than to the more affected side, while the Rinné and Schwabach tests will show

a relatively diminished hearing by bone-conduction on the affected side. In this way may be classified all the functional tests of the ear under the various principles which they elucidate.

The Treatment of Chronic Suppuration of the Middle Ear.—James F. McKernon,¹ in a study of the many methods advised at the present date in the treatment of chronic suppuration of the middle ear, summarizes the methods which he thinks most advisable, treated clinically under the two heads, namely, the dry and the irrigation or wet treatment. In the treatment of all cases three objects are kept in view: (1) Cure of the otorrhea; (2) improvement of the hearing; and (3) relief of the subjective sounds when present. In the beginning of treatment in any case a careful examination of the nose and nasopharynx should be made for the detection and removal of obstructions in either one or both localities. At the outset the first cardinal principle in treatment as regards the ear itself is to secure and maintain cleanliness of the auditory canal and the parts adjacent; next, to determine just what structures of the middle ear are involved, since this will have a decided bearing upon the progress of the case; and, finally, to locate the opening in the drum membrane and ascertain whether the present opening is draining the cavity sufficiently, and, if not, to enlarge it. Ascertain at the first examination and before treatment is begun whether any caries of the ossicles or the adjacent structures exists, which can easily be made clear by cocainizing the point of the perforation and using the silver probe to palpate with; but the mistake should not be made of calling every particle of exposed bone "dead bone." Under dry treatment he considers the following methods: The hands of the person who is to treat the case are first made sterile; then sterilized cotton is used on a carrier to wipe the canal thoroughly dry. After this drying process a fine powder is insufflated over the drum surface as well as the canal walls; the powders commonly used are xeroform, nosophen, boric acid, acetanilid, aristol, and iodol; following this a small wick of gauze, iodoform, borated or plain sterilized, is passed up and, if possible, into the perforation, and the canal loosely filled to the meatus. If the opening in the drum is too small to admit the end of the gauze, the canal is loosely packed from the drum to the meatus, which acts as a siphon to carry away the discharge. As soon as this becomes thoroughly moistened with the discharge it should be removed and the process of cleansing carried on as before. He states that the chief objection to this method of treatment is the absence of a trained nurse to carry it out on antiseptic lines; he thinks, however, if this could be arranged for, it might become the ideal way of treating this disease. The irrigation or wet treatment, which is the one ordinarily used to-day among the majority of aurists, consists in syringing the ear with one of the following solutions: mercuric chlorid, 1: 8000-1: 4000; boric acid, 20 grains to the ounce of boiled water; carbolic acid, from 1 % to 2 % solution; a weak solution of formalin and a solution of potassium permanganate; a normal saline solution. The author believes that all but the latter could be dispensed with in a great majority of cases

¹ Med. News, Jan. 17, 1903.

did we but try. When the patient is seen by the surgeon and the parts cleansed in the manner described, a good solution to further sterilize the parts is composed of equal parts of the solution of mercuric chlorid, 1: 1000, and absolute alcohol; to this can be added boric acid, from 10 to 20 grains to the ounce. Granulations may be destroyed by silver nitrate or chromic acid, the parts being cocainized before either is used. If polyps are present they can be saturated with a solution of cocain or eucain and adrenalin and be removed by the curet or snare, cauterizing the base after their removal. The canal now being clear, the irrigations may be used, first every 2 or 3 hours, depending upon the profuseness of the discharge, lessening their frequency as the discharge diminishes. After the canal is cleansed and just prior to stimulating the parts, direct the patient to perform Valsalva's method of inflation to expel retained secretion through the opening in the drum. In case the patient is unable to do this, perform gentle inflation by means of the catheter; then remove the secretion thus displaced before the final application is made to the surface for stimulation. Later the patient may be instructed to use one of these cleansing solutions by placing from 5 to 8 drops in the ear morning and evening. As to the use of hydrogen dioxid there is a wide diversity of opinion, the author favoring its use only in cases in which the perforation in the drum is a large one, though he thinks a better and more stable preparation in all cases would be hydrozone. When the discharge is persistent and there is an area of exposed bone complicating the simpler condition, he finds the use of carbolic acid of great value. With the head placed in a horizontal position the canal is partially filled with pure carbolic acid and allowed to remain about 30 seconds, when the canal is syringed with pure alcohol. The alcohol counteracts any escharotic action which the acid would have upon the normal tissues and yet at the same time allows the diseased parts to be thoroughly cleansed and stimulated. When, after all the ordinary methods of treatment, a small perforation exists with little or no moisture, the method suggested and practised by Blake, of fitting a very thin piece of sterile paper over the existing opening, will oftentimes heal the perforation. Flexible collodion may also bring about the same result. To improve the existing tinnitus after the otorrhea has ceased, inflation or vaporization of tube and middle ear may be practised, with internal administration of strychnin in tonic doses, as well as small doses of iodid of potassium.

Reflex Movement of the Auricle of the Ear.—E. Donaldson¹ states that among the reports of skin reflexes he is not aware that a reflex movement of the auricle has been mentioned. The case he reports is that of a man aged 54 years who came under his observation in May, 1902, with suppuration of the right middle ear with polyp. The discharge first began when he was 8 years of age and continued 17 years, since which time there had been no recurrence until the beginning of April, 1902, when the discharge was observed accompanied by considerable pain. The polyp was removed by means of a snare. He was very deaf in this ear, not being able to hear a watch on contact. As a part of the treatment

¹ Lancet, Aug. 23, 1902.

powdered boric acid was insufflated through an ear speculum without holding the auricle. At each puff the auricle was observed to move distinctly forward to the extent of about $\frac{1}{4}$ inch; afterward at different sittings he observed that this reaction could be produced by blowing air from a small india-rubber bag into the auricle in the locality of the external meatus, the best result usually occurring from the first puff. The movement of the auricle would sometimes not occur after 3 or 4 puffs in rapid succession, though in no sitting did he fail to get the reaction. In making the observations he states that he was careful to exclude voluntary movement, and a movement that was only a part of a more general scalp movement. The patient was unable to prevent the reflex from taking place, nor was he able to produce the movement voluntarily, though he was quite conscious of the reflex movement. The left ear was normal and this reflex was only slightly observed in a backward direction.

Ozone in Chronic Middle-ear Deafness.—George Stoker¹ reports satisfactory results in the treatment of what is popularly known as throat deafness, or technically chronic dry catarrh of the middle ear. It is generally believed to be due to stenosis of the eustachian tube, which may arise from interference with nasal respiration due to congenital malformation or to hypertrophy of the mucous membrane of the nose or nasopharynx. The symptoms are progressive deafness with tinnitus of various kinds and of varying intensity. The tympanic membrane is retracted and usually opaque. There are no signs or symptoms of the auditory nerve being involved, and of all forms of deafness this may be considered the most common and the most intractable, and it is no exaggeration to describe it as the opprobrium of otology. The stenosis of the eustachian tube affects the mucous membrane lining the middle ear by preventing the free ingress and egress of air, and by confining the secretions, thus setting up inflammatory conditions, which lead to thickening of the mucous membrane and consequent deafness. The nasal stenosis may be relieved and the eustachian tube may become more patulous, but the deafness still increases; this points to a remaining unhealthy condition of the middle ear. The effect of oxygen, and more particularly of its allotropic form, ozone, in restoring a healthy condition to diseased nasal mucous membrane led to a trial of the latter in chronic progressive deafness. The ozone was generated by means of an electric current acting on a Ruhmkorff's coil to which the ozonizing tube was attached. The ozone thus generated was pumped into the middle ear through a eustachian catheter for about 3 minutes from twice to four times a week, according to opportunity. In the 4 cases reported extremely gratifying results were obtained and in a remarkably short period of time. A particularly interesting feature is the disappearance of the tinnitus after a few applications. Stoker thinks it reasonable to suppose that the results would be even better if the ozone could be used every day.

Perforation of the Membrana Tympani from Lightning Stroke.—H. McNaughton-Jones² reports the case of an officer who, while sitting

¹ Lancet, Nov. 1, 1902.

² Med. Rec., Aug. 23, 1902.

in his tent drinking from an iron cup during a storm, received a shock from a thunderbolt which rendered him unconscious for a time. He was paralyzed, except in the left arm, and various burned areas were scattered over his body. The hearing of the left ear was seriously affected, and on examination a few days later the membrane was found to be perforated in two places, with marked injection and of a deep red color. Considerable tinnitus was present. With the application of a weak silver solution, protection of the ear with gauze, and an occasional inflation a gradual recovery was made.

Chloroform in Earache.—The "Journal of the American Medical Association"¹ quotes an abstract in the "Courier of Medicine" of a simple, harmless, and infallible cure for earache. A small funnel of stiff paper is inserted into the ear and in the larger end is placed a pledget of cotton saturated with chloroform. With a long breath blow through this, carrying the fumes of the chloroform into the ear. Instant relief is claimed.

Nonoperative Measures for Preventing and Combating Inflammation of the Mastoid Cells.—Samuel Theobald,² while fully recognizing the importance of operative measures for inflammatory and infective conditions of the mastoid cells according to the generally recognized indications, believes that far too little attention is given to other measures which may not only alleviate the painful symptoms, but prevent and even cure those cases which have developed. In expressing his opinions he calls attention to an article which he published 20 years ago, and states that his views are still in accord with those set forth at that time, since in a large experience the results obtained are sufficient justification. He divides his nonoperative measures for the prevention of inflammation of the mastoid cells into what pertains to mastoiditis occurring as a consequence of chronic inflammatory processes of the ear and to that occurring as a complication of otitis media acuta. In regard to the first, the object is to control the inflammation in the tympanum and thus avoid the risk of its extension to the antrum and mastoid cells, accomplished by means of building up the system with suitable tonics, eliminating habitual constipation if present, and the use of antiseptic solutions to control the suppuration. The antiseptic which he finds most efficacious is mercuric chlorid, 1 : 8000 or 1 : 4000, or as his second choice boric acid in saturated solution. Contrary to the more universal teaching, he advocates the use of the syringe by the patient himself, with an occasional inspection of the ear by the aurist. To avoid implication of the mastoid cells in acute inflammation of the middle ear, energetic measures should be employed to control the otitis and, if possible, to abort it in its incipency, in which one must be guided by the cause of the attack and the stage of the disease at the time the case comes under observation. For this he expresses an abiding faith in the antiphlogistic value of energetic purgation, especially with calomel; aside from the use of this drug as a purge, he advocates its employment in small doses for its specific effect upon the infection. Bearing in mind the peculiar characteristics of the membrane which lines the mastoid cells—a periosteal as well as

¹ Dec. 20, 1902.

² N. Y. Med. Jour., Sept. 13, 1902.

a mucous membrane—in inflammatory conditions involving the walls of these cells, especially in their early stages, mercury, of all remedies, should prove efficacious. Another remedy which he strongly recommends is the pyrophosphate of sodium administered in liberal doses, 20 grains for an adult or 10 to 15 grains for a child, every 2 hours. The same antiseptic solutions for cleansing the ear are indicated in each condition, though in the latter, owing to the profuseness of the discharge, more frequent irrigation is required.

Mastoiditis Due to the Gonococcus.—Charles Trow¹ reports the case of a man aged 22 years, admitted to the Toronto General Hospital suffering from a somewhat diffuse swelling about the mastoid process with moderate degree of pain. The patient was of a poorly nourished type, never having been really well, though he had had no definite illness, with the exception of a chronic diarrhea which had occurred intermittently for 10 years, being diagnosed 5 years ago as being of tubercular origin; had suffered from slight attacks of the grip for several winters, and denied absolutely ever having had gonorrhea or other venereal trouble. The present trouble originated about 5 months ago, following exposure to wet and cold, when a small lump appeared in the submaxillary region near the greater cornu of the hyoid bone, and at the same time he experienced a sore throat. This was followed a week or two later by a sharp pain in the right ear which lasted for several weeks, being followed by slight swelling behind the ear, with a yellow discharge from the ear and right nostril. In this condition he was admitted to the hospital, with a temperature about normal, never higher than 100°. On examination a diffuse swelling in the mastoid region was apparent, which seemed to extend some distance below the tip of the process. Pressure showed pitting with but little tenderness, the discharge moderately abundant with no bulging of the posterior wall of the external meatus, while the drum showed marked congestion with a perforation about the size of a pin's head at the lower anterior quadrant. On operation the whole mastoid region was carious, with the lateral sinus bathed in pus and an opening through the posterior inferior part of the process into the tissues of the neck. After thorough curetment and packing with iodoform gauze the patient recovered without subsequent discharge, with perfect hearing. The interesting feature of this case lies in the examination of the discharge from the ear and nose, which showed by the ordinary stains abundant pus-cells, in which, clustered about the nucleus, were many diplococci morphologically and in point of size identical with the gonococcus. Furthermore, the microorganism was decolorized by Gram's solution; cultures were made on nutrient agar-agar and on Löffler's blood-serum, but no growth could be obtained. Löffler's blood-serum was then smeared with blood carefully drawn with antiseptic precautions from the ear of another patient and inoculations from this discharge. Incubation at the body-temperature for 36 hours showed a growth which on staining proved to be a noncapsulated diplococcus. The discharge from the nasal cavity showed the same form of diplococcus, as did also

¹ Canad. Pract. and Rev., March, 1903.

that taken from the mastoid during the operation. Examination of nasal discharge and material from mastoid cavity 2 months later did not show gonococci. The wound had nearly healed and the patient had gained 10 pounds in weight.

Salient Points in the Treatment of Catarrhal Deafness.—Sargent F. Snow¹ states that without question the successful handling of a case of chronic catarrhal deafness means more careful consideration and more broad, painstaking work than any other condition which aurists are called upon to treat. He believes that while local intranasal factors bear an important relation to the ear and must be taken care of before embarking upon the treatment of deafness itself, the mistake is often made of attributing to them undue importance in the causation of disease, with an unwarranted hope of cure from their removal. However, if closer attention be paid to the general systemic conditions, to clothing, diet, exercise, the bath,—in fact, any hygienic measure which will promote a healthy action of the excretory apparatus, especially the skin,—he believes that a good prognosis should be given much more frequently than we have been accustomed to in the past. As regards local treatment, he believes the most effective method of handling chronic cases of catarrhal deafness is by jets of stimulative vapor, made by passing air under pressure over a supersaturated solution of gum-camphor in tincture of iodine, through the eustachian tube to the middle ear.

Otomycosis in the Malay Archipelago.—D. J. Galloway,² of Singapore, reports an exceedingly interesting parasitic affection—otomycosis—prevalent in the Malay Archipelago. In studying a series comprising hundreds of cases of ear-diseases this affection was found in 70 %, and, contrary to most tropic parasitic affections, it is found most frequently in Europeans and next in persons of mixed parentage; it is very rarely found in Arabs and Malays, and in the Chinese scarcely at all. The subjective symptoms may be pain of a subacute character or there may be only a slight discomfort with itching of the meatus. The anatomic changes are proliferative and not inflammatory, some solution of continuity being necessary in the membrane lining the meatus to convert a pure otomycosis into a meatitis. The primary cause of the disease is a fungus, *Mucor mucedo* being the most frequent, though occasionally *Aspergillus flavescens* is found. The marked preponderance of *Mucor mucedo* is peculiar to the locality, other species being found in China, Siam, and the Dutch East Indies, while in Europe the *Aspergillus fumigatus* is most common. Among predisposing factors sea-bathing is particularly mentioned, certain bathing resorts having gained special notoriety from the frequency with which the disease develops. The presence of the parasite alters the character of the cerumen, general debility favors the invasion, and at times healthy secretions and the presence of the parasite are noted in the same case. After having advanced for a time, however, all normal cerumen disappears. Pathologic changes are dependent upon the depth of tissue-involvement, a thin pellicle of the parasite closely

¹ Buffalo Med. Jour., Jan., 1903.

² Jour. of Rhinol., Laryngol., and Otol., Feb., 1903.

adherent to a part of the meatus and tympanic membrane only being found in uncomplicated cases; in the mildest form of the disease only the sebaceous glands are affected, producing increased secretion, which forms with the mycelium a thin covering limited to a cartilaginous meatus. More advanced irritation produces an infiltration of the deeper layers of the integument, a sodden condition of the horny layer, accompanied by serous exudation. In all varieties there is exfoliation of the pavement-cells, while in the moist variety there is a denudation not unlike eczema. Occasionally trauma effects a portal of entrance to the deeper layers, which may be followed by an acute diffuse meatitis. There is tumefaction or perichondritis, and the membrana tympani may participate in its whole thickness with a certain amount of hyperemia of the middle ear. No pus is formed. The objective signs of the disease are characteristic, there being in the dry variety abnormal cleanness of the meatus, absence of cerumen, and in its place a few yellow scales, dry and easily detachable. In the deeper parts may be seen a light mother-of-pearl-colored pellicle extending over the membrane and outward over the canal. In another variety the canal walls are covered by a dense, dull membrane of a yellowish-white color with large detachable flakes; this membrane may be removed as a hollow cast by the syringe, frequently leaving a red oozing surface. In the moist variety the canal is filled by a grayish-white mass resembling white blotting-paper, the most persistent symptom being itching, which remains as long as there is a trace of the parasite. Deafness varies with the type of the disease, there being little interference with the conduction of sounds in the dry variety, while in those cases in which a firm thick membrane covers the deeper meatus and membrana tympani the deafness may be considerable. A sensation of moisture in the meatus is usually felt and there is an extrusion of particles from the meatus during movements of the jaw; this may be scaly, membranous, or soapy, according to the type of the disease. In the treatment Galloway states that any good antiseptic may be employed, such as mercuric chlorid or silver nitrate, which may be used in considerable strength unless there is desquamation of the epithelium lining the canal.

Deafness.—M. Marage¹ makes some interesting deductions from articles which have been read during the past 7 years before the Academy of Medicine, the Biological Society, the Academy of Science, and the Society of Physics. These works consist mostly of competitive essays on the study of auditive acuity, the functions of the ossicles of the ear, and of the composition of the liquid of the internal ear and of the otoliths. From suggestions in these works Marage has been able to make some practical conclusions with reference to diagnosis and treatment of diseases of the ear. In one series he has taken up cases of deafness accompanying old age, excluding any that required surgical interference. In experimenting on these cases he found that the acoumeters in present use give very unreliable tests. With reference to the diapason, it is as yet impossible to obtain a definite degree of sonority of the various

¹ Bull. de l'Acad. de Med., July 1, 1902.

forks, or the force of the stroke necessary to set them in vibration. How then can we measure the time when a sound ceases or when the patient stops hearing it? He finds also a marked difference in the ability to hear musical sounds in contrast to those of ordinary conversation. Following these experiments he was led to devise an instrument, by means of a siren fitted with a sounding board, that will produce vowel-sounds; their intensity being regulated by air-pressure. With reference to the ossicles of the ear, while well understood in their essential mechanism, he believes that their motility has been very largely overestimated, since instead of the vibratory movements of the drum membrane being capable of one-tenth of a millimeter displacement, the actual movement probably does not amount to a thousandth of a millimeter. The consequence is that in the practice of massaging the tympanum extreme pressure may become dangerous by transmitting to the bony chain too much in excess of that received under physiologic conditions. In his cases he has not found that those with the greatest loss of hearing are the least responsive to treatment. With reference to the liquid of the internal ear he has not been able to obtain it in sufficient quantity for a thorough chemic analysis, though he finds it to be of a very high density. By means of the radiograph he has been able to detect in frogs otoliths in suspension in this liquid. An analysis of these bodies shows their composition to consist of bicarbonates of lime and magnesium with an excess of carbonates. Their function is likely to assist in maintaining a constant degree of density of the liquid in which they are suspended. They are found to be soluble in certain acid quinin salts, from which fact Marage thinks that we have an explanation for the buzzing in the ears when a large amount of quinin is administered. He thinks that we may give credence to this, since ethyl carbonate of quinin, which has no effect on the otoliths, may be administered without producing buzzing in the ears.

Observations on Anesthesia of the Drum Membrane.—George B. McAuliffe¹ states that while the majority of clinicians do not believe in trying to obtain local anesthesia of the membrana tympani, their deductions have been drawn in the main from the futility of using cocaine for this purpose in the external meatus. This difficulty, as is well known, is produced by the dermal layer of the drum membrane, a skin without glandular elements, acting only as a shield for the layers beneath, an effort of nature to protect the tympanic cavity from fluids dropped by chance or design into the external canal. Jacques, by utilizing the selective action of methylene-blue, mapped out the nerve plexus in the middle layer of the drum membrane. In the deeper portions of the dermal layer detached bundles run in different directions and end in apparently sensory end-tips. The mucous membrane of the eustachian tube and that of the tympanic cavity receive their main nerve-supply from the glossopharyngeal, which facts show that the external dermal layer has very little to do with sensitiveness of the drum membrane, and that most of the solutions dropped into the ear have little effect until they nullify the shield-like action of the skin covering. The various

¹ Canad. Pract. and Rev., Dec., 1902.

methods of freezing by means of ethyl chlorid have been found impracticable, since it does not desensitize deeply enough, nor can the area be localized, besides the pain which always accompanies both the freezing and the thawing. Thus he concludes that the best method we have is the application of cocain after the preparation of the membrane by the use of other applications which will aid in its absorption; in other words, fluids which disturb the osmotic equilibrium of the membrane and produce minute solutions of continuity in the dermal layer, thereby allowing cocain to reach the nerve filaments. The conditions favoring the application of cocain are the removal of foreign substances and loose scales from the drum membrane and canal, dehydration of the outer layer of the membrane, and the induction of endosmosis. The first condition is met by the use of hydrozone, which he thinks better than any other kind of hydrogen dioxid; while the second and third conditions are met by the use of alcohol and anilin oil. By the use of solutions of 5 % to 20 % cocain with equal parts of absolute alcohol and anilin oil anesthesia is gained in from 10 to 15 minutes. The disadvantage of the solution is that the anilin oil is toxic and obscures the field, which difficulty, however, may be obviated by making the application on a small cotton pledget. He states that during the past 6 years he has experimented with tubal injections of cocain, but without satisfactory results. He draws the following conclusions: (1) The dermal layer need not be considered in local anesthesia of the membrane, and does not play so great a part in sensation as the mucous layer, since palpation of the skin surface does not elicit pain, although it reaches only the mucous membrane. (2) The pain does not result from a local impact, but from the excitation of the whole sensory apparatus of the tympanic cavity, induced, no doubt, by the sudden abnormal inward movement of the contents. (3) The pain of incision depends on the impression made on the drum membrane by the knife as much as on the cutting, hence the advisability of making a minimum amount of pressure by using as sharp and as thin a knife as is practicable. This explains why incision in the membrane is made so much easier by the use of the Graefe knife than by the poor knives made especially for the work, knives whose smallness of blade precludes sharpness of edge. (4) In order to produce the best results isotonic or isoosmotic solutions of cocain should be used in order to avoid edematization of the tube and subsequent transient otitis media.

Cardiac Reflex of Auricular Origin.—Massier,¹ of Nice, reports a case of auricular reflex in which indurated and impacted cerumen produced an intermittent action of the heart. The case reported is that of a physician who for a long time had suffered from an intermission of the pulse followed by a few painful palpitations. On auscultation at various times and by different physicians no organic heart-lesion was found and all the other organs were in apparently good condition. The symptoms mentioned occurred in any position of the body and were not influenced either by fatigue or by active exercise. His attention being attracted to his ears by the occurrence of tinnitus, the patient consulted Massier.

¹ Ann. des Mal. de l'Oreille, etc., Oct., 1902.

who discovered and removed an accumulation of impacted cerumen. Following this the palpitations were diminished, but the canals were left in an inflamed and sensitive condition for some weeks, when more wax was removed and the heart became regular and no further discomfort was experienced. The author naturally concludes that the cardiac irregularity was due to reflex irritation, since the ear-canal is supplied with its sensory branch from the pneumogastric, which through irritation gave rise to an inhibitory impulse affecting the heart.

A Case of Delayed Healing of Extensive Mastoid Wound Treated by Means of Skin-grafting.—Wendell C. Phillips¹ reports favorable results following skin-grafting to close a large wound following a mastoid operation. Since the primary operation for the mastoid disease in February, 1901, 3 additional operations had been performed, the last one in April, 1903, all for the removal of small pieces of diseased bone. The repeated operation had left such an extensive wound that it was determined to use the method herein referred to for its closure, which after 2 attempts proved very successful. Phillips thinks this method might be utilized to advantage in the delayed healing of many extensive mastoid wounds.

Influence of Acute Mastoiditis on Audition.—J. F. McCaw,² in a study of this subject, comes to the following conclusions: (1) Great reliance can be placed on abortive measures in the hemorrhagic variety of acute tympanomastoiditis following influenza, with a reasonably good prognosis of normal hearing. In no other form of the disease can this be done. (2) The period of the disease at which appropriate treatment is applied influences the ultimate functional result. (3) In all cases requiring operation, the earlier the surgical treatment is resorted to, the greater will be the amount of hearing preserved. (4) The dry method of postoperative treatment seems to influence the function of audition, but to a less extent than early surgical interference.

Beer Yeast in Otology.—L. Sune y Molist³ has reported satisfactory results following the use of beer yeast administered by the mouth for otitis media, mastoiditis, and otitis externa furunculosa. He uses a special preparation compounded from the formula of Fita, known as *cerevisina-Fita*, a teaspoonful being given every 4 hours. In a case of mastoiditis the pain subsided and the swelling markedly decreased upon the day following administration; and by the fourth day the inflammation had entirely disappeared. He obtained equally good results in a case of acute suppurative otitis with perforation of the tympanum and involvement of the mastoid cells. He thinks there is no question but that this substance exercises a specific effect upon pyogenic organisms in suppurative conditions.

Operative and Other Treatment of Chronic Suppuration in the Middle Ear.—Charles J. Heath⁴ lays great emphasis on the avoidance of using the syringe for cleansing purposes and the importance of drying the ear with suitable wool mops and then passing the fluid remedy through

¹ Med. Rec., Nov. 1, 1902.

² Laryngoscope, April, 1903.

³ Rev. Cien. Med. de Barcelona, xxviii, No. 7, 1902.

⁴ Lancet, Feb. 21, 1903.

the perforation of the membrane and into the eustachian tube to the nasopharynx so that it can be tasted. Frequent applications are advised, and since the patients must use it at home, a nonpoisonous is insisted upon. He uses spiritus vini rectificatus and thinks that if applied in the manner stated and pumped through to the nasopharynx, using the tragus as the pump, it will cure 30 % of all cases. Removal of ossicles and membrane when diseased does not as a rule stop the discharge, since generally, if the bones are diseased, the attic and antrum are also affected and the complete postaural mastoid operation should be carried out. The presence of granulations and bare bone in the tympanum does not show that the antrum is diseased, and these conditions are often rendered healthy and the discharge entirely stopped by the treatment referred to. After the radical operation he strongly recommends the glycerin and iodoform emulsion as an antiseptic application to the cavity. In sewing up the wound completely behind the ear he allows the anterior flap to overlap slightly the posterior, thus securing a better scar and preventing the ear turning outward or becoming depressed into the large meatus.

Diagnosis and Treatment of Tuberculous Disease of the Middle Ear and Its Accessory Cavities.—W. Milligan¹ treats the subject in detail and summarizes as follows: (1) In all cases of middle-ear disease of suspected tuberculous origin search should be made for tubercle bacilli either in the discharge, in tufts of exuberant granulation-tissue, or in enlarged periotic. (2) Inoculation experiments (either subcutaneous or intraperitoneal) afford a ready and trustworthy means of proving or excluding the tuberculous nature of the disease. (3) A final and exact diagnosis is imperative both from the point of prognosis and from that of treatment. (4) Tuberculous disease of the middle ear and accessory cavities is frequent among infants and young children. (5) The disease is most frequently found as secondary to tuberculous processes in other regions of the body. (6) Primary tuberculous disease of the middle ear is probably of more frequent occurrence than has usually been supposed. (7) The prognosis is always grave, but in a certain proportion of cases suitably planned surgical intervention would eradicate the disease. (8) In many of his cases it was advisable to conduct the operative treatment in stages. (9) When less than 10 % of hearing power remains, no attempt should be made to preserve the organ as an organ of special sense. (10) When more than 10 % of hearing power remains in a patient in otherwise apparent health, a definite attempt should be made to preserve the hearing power which still exists. (11) When the tuberculous origin of the disease has been scientifically demonstrated, the case should be regarded as infectious and precautions taken accordingly.

Microscopic Examination of the Discharge in 100 Cases of Middle-ear Suppuration, with an Analysis of the Results.—Wyatt Wingrave² presents the following points of interest: (1) Acid-fast and alcohol-fast bacilli were found in a large proportion of chronic purulent ear discharges. (2) In 17 cases they were presumably tubercle bacilli in so far that they conformed to the recognized morphologic and staining characteristics, and were for the most part associated with trustworthy clinical evidence

¹ Lancet, Feb. 21, 1903.

² Lancet, Feb. 21, 1903.

of tuberculosis. (3) In 7 cases, while conforming in a greater or less degree to the staining requirements, they were morphologically unlike tubercle bacilli, yet 5 of them had either a family or a personal history of phthisis. (4) The success in their demonstration in a great measure depends upon the method of collecting and staining, together with perseverance in search. (5) In the peculiar selective action of the squames—a property specially attributed to certain bacilli—they had a possible source of error in diagnosis and an explanation of the peculiar affinity of other bacilli or fuchsin.

Ossicectomy.—Edward B. Dench,¹ in summing up the indications for the operation of ossicectomy, divides the cases into 3 classes: (1) Those cases in which the patient suffers from what is commonly known as chronic nonsuppurative otitis media, in which the membrana tympani has always been intact, and for which operative procedures are undertaken either for the improvement of the function of the organ or for the improvement of certain symptoms, such as subjective noises and vertigo. (2) Those in which an operation is undertaken primarily for the relief of chronic suppuration. Here the principal object is to remove all dead bone from the tympanic cavity and cause a cessation of the discharge. Incidentally, the surgeon may also aim to improve the hearing; likewise to relieve subjective symptoms. (3) Those in which there has been previous suppuration, but which is at present so slight as to cause the patient no inconvenience and constitutes practically no menace to life. In this class the ossicular chain is bound down by adhesions, and the function of the organ impaired as the result of the changes which have taken place within the middle ear. The author enters fully into the consideration of each of these classes, giving indications for operation, technic, with the dangers which may be encountered. The results obtained, according to his statistics, seem to show a larger percentage of cases cured and improved than has heretofore been reported. Out of 88 cases of chronic nonsuppurative otitis with operation for the improvement of function, 76 were improved, 10 were unimproved, 1 grew worse after the operation, and in 1 the result was unknown. In those cases with operation for the relief of suppuration, out of 92 cases 53 were cured, 25 improved, 2 unimproved, and in 12 the result was unknown. He states that the effect upon the hearing in those cases of operation for suppuration has not been accurately determined in every case, though nearly all showed improvement, and in no case was the hearing made worse.

A New Method of Treating Suppurating Catarrh of the Middle Ear.—Albert A. Gray,² following his experiments, which were published a few years ago in the "*Lancet*," in the use of solutions of cocain in anilin and alcohol in order to produce anesthesia, gives the result of treating chronic cases of suppuration with a saturated solution of iodoform in anilin. The cases reported range in age from 3 to 38 years, in one case the discharge having continued for more than 30 years. Owing to the toxic effect of anilin, he finds that it is not safe to use more than 5 drops of the solution at one time. His technic is the same as that usually adopted: first cleansing the ear with hydrogen dioxid or alcohol, and after

¹ *Med. News*, Feb. 28, 1903.

² *Lancet*, April 18, 1903.

drying carefully with a cotton-wrapped probe he inserts a small tampon moistened with the solution. In conclusion he emphasizes the following points: (1) The solution should be measured before use. (2) The drying out should be done with the same care as is required in the present methods of treatment. (3) Granulations should be removed, though this is not quite so imperative as it is in other methods of treatment. (4) The applications should be made by the surgeon himself. (5) The use of the solution is particularly indicated in those cases which do not do well when treated in the usual ways—that is, in foul-smelling and presumably tuberculous cases.

The Ear from a Medicolegal Standpoint.—W. Scheppegrell¹ explains the importance of making a careful examination of the patient, and of not being guided too much by the history given. In illustration of this, he cites a case in which the patient accused the defendant in a suit for damages of having been the cause of injury to the ear, when the clinical examination had demonstrated that the real cause of the injury was due to an infected toothpick which the patient had used to remove a foreign body, the toothpick having caused a perforation of the drum and an infection of the middle ear. The evidence of Scheppegrell, from notes which he had taken of the case, at once secured the release of the defendant in the suit. He also calls attention to the importance of making careful notes in cases of injury, as these may afterward become the subject of court cases.

Tobacco Deafness.—Wyatt Wingrave² states that there seems to be an undoubted tobacco element in the etiology of certain cases of deafness. He divides the cases into 3 classes, as follows: (1) Mechanical or pneumatic; (2) irritative or catarrhal; and (3) toxic or nerve-deafness. In this last group he alludes to 17 cases and adduces the following points: They were all marked cases of nerve-deafness unattributable to other causes and occurring in heavy smokers. The loss of low tones in 50 % suggested an auditory equivalent for a recognized ocular lesion. There was definite scotoma in 4 cases and impaired sensation of vision in 8. The disease was symmetric; and 80 % showed marked improvement on abstinence from tobacco, and with supplementary drug-treatment 3 were cured.

Aural Bougies.—G. L. Richards³ describes some medicated bougies for the relief of earache and otitis externa. They can be wrapped in tin-foil or dispensed in lycopodium powder, and after dipping in warm water are inserted into the external auditory canal. They are the size of a quill and half an inch long, and in the experience of Richards have been instrumental in aborting earache in more than one-half of the cases occurring in children. Their formula is a modification of Gruber's, and is as follows:

R. Carbolic acid	m_{15}^1	(0.004)
Fluid extract of opium	m_{15}^1	(0.0085)
Cocain	gr. $\frac{1}{4}$	(0.015)
Atropin sulfate	gr. $\frac{1}{4}$	(0.004)
Add sufficient water, gelatin, and glycerin to make a mass which will dissolve at the body-temperature.		

¹ Amer. Med., June 28, 1902.

² Med. Press and Circ., Feb. 11, 1903.

³ Med. News, Aug. 3, 1902.

The Radical Operation for Chronic Suppurative Otitis Media.—

Chevalier Jackson¹ advocates the radical operation for chronic suppurative otitis media in the absence of mastoid symptoms when suppuration has failed to yield in 3 months after ossiculectomy followed by wick treatment. His results in hearing are very much better in cases in which he has healed the posterior wound from the bottom, removing the posterior bony wall, but not incising the fibrous canal, this having also the advantage of avoiding the deformity of the concha necessary to an adequate meatal opening for efficient after-treatment in the usual Staacke-Schwartz operation with Korner or Panse flaps. When both ears are affected he advises invariably against these operations, and in favor of posterior healing from the bottom on account of conserving the hearing. He describes a method of posterior skin-flaps to hasten healing, also a new chisel trephine, mallet, and otologists' rule for Reed's base-line.

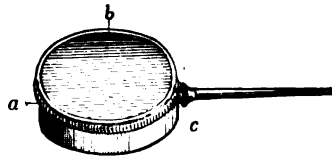


Fig. 129.—Brown's powder insufflator.

Powder Insufflator.—H. Grey Brown² has designed an insufflator which can be sterilized either by dry heat or by boiling (Fig. 129). It is on the principle of what is known as Bart's puff, but with the following alterations: (1) The pipe unscrews at *c*. (2) The top, *b*, is made of spring metal. (3) For introducing the powder the screw-top at *a* is removed. (4) The aperture of the pipe inside is covered with a piece of gauze to prevent large pieces of powder being blown through. (5) There is no solder used, allowing the insufflator to be sterilized by dry heat, in which way, if desired, the powder may be sterilized inside the instrument.

A Wire Loop for Aural Snares.—Harold Wilson,³ to obviate the difficulty which often arises in having to rethread an aural snare several

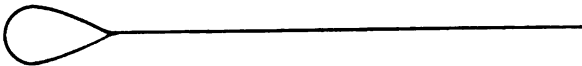


Fig. 130.—Wilson's wire loop for aural snares.

times during a single operation, has devised a loop with the ends of the wire twisted so that it may be inserted into any snare with a single open cannula with very little trouble. A piece of malleable steel wire, No. 36 or No. 40 (about one foot in length for the Blake snare), is doubled and twisted (best in a small lathe, holding the loop end between the fingers), leaving the loop of any desired size. These loops are so very easy to make and so inexpensive that they may be made up and kept on hand in sufficient numbers to have them always ready (see Fig. 130).

An Improved Otoscope.—J. B. Ball⁴ states that instruments in which

¹ Ann. of Otol., Rhinol., and Laryngol., Nov., 1902.

² Brit. Med. Jour., Jan. 10, 1903.

³ Jour. Am. Med. Assoc., Nov. 15, 1902.

⁴ Lancet, May 23, 1903.

a speculum, a reflector, and a magnifying lens are combined in one piece have long been used for inspection of the ear. On this plan he has had constructed an otoscope, small and very portable (Fig. 131). The interior of the otoscope and speculums, instead of being bright, as in the otoscopes at present most in use, is black, thus bringing out by contrast the image of the parts to be examined with striking clearness. It can be

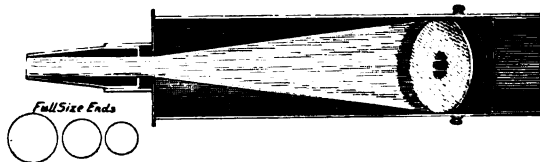


Fig. 131.—Ball's improved otoscope.

used with good daylight, sunlight, or artificial light. It is fitted with three speculums of different sizes, which can be used separately with the frontal mirror if desired. The interior of the speculums is first bronzed, then blacked, so that they may be sterilized by boiling; the exterior of the instrument is heavily plated so as not to tarnish.

ANATOMY.

By C. A. HAMANN, M.D.,
OF CLEVELAND, OHIO.

BONES, JOINTS, AND MUSCLES.

Os Metopica.—Raubert¹ discusses the presence of an os metopica, or os interfrontalis according to his nomenclature, and an os supranasalis in the corresponding fontanel. On the external surface of the frontal bone and 20 mm. above the nasion he found distinct traces of sutures, which he believes to have been continuous with two corresponding sutures on the internal surface. These sutures appear on the lateral surface of a small narrow plate of bone, which is termed by the author os interfrontalis. Schwalbe claims that proof is lacking of the separation of these bones at the upper and lower extremity, and that the formation might have been irregular, having been developed from above and below instead of laterally. Schwalbe has never observed an os metopica although they have been reported by E. Fischer. Above the root of the nose the author has observed an elongated piece of bone, surrounded by the remains of the supranasal sutures first described by Velpeau in 1837, and later by Schwalbe. This bone he considers an os fontanellæ supranasalis, although Schwalbe declares that this area of bone is the result of irregular suture formation.

The Amount of Fluorine Contained in the Bones and Teeth.—Jodlbauer² found that herbivora and carnivora show no great difference as to the quantity of fluorine, although it does vary considerably in some animals. The flat bones of some animals contain less fluorine than the long bones, although the percentage is not constant in the different long bones. The humerus contains more fluorine than the femur. Whether the function or the nutrition of the bone has any relation to this element remains to be seen. The teeth contain a greater quantity of fluorine than the bones. The enamel is responsible for this large percentage. The back teeth contain more than the front. The tooth germs contain more than the first teeth. The relatively small quantity of fluorine at this early period would give the impression that the lower jaw sacrifices its fluorine at this period for the embryonic teeth.

Histology and Histogenesis of Cartilage.—Srdinko³ has found in the cartilage of mammalian and human embryos cells with protoplasmic prolongations. These cells are devoid of a capsule and divide by the

¹ Anat. Anz., Oct. 24, 1903.

² Zeit. f. Biol., N. F. xxvi, p. 259, 1902.

³ Anat. Anz., Jan. 30, 1903, p. 437.

formation of a great many daughter-cells. Many of these cells in their youthful state are bound together by protoplasmic anastomoses, which have been demonstrated by various methods. The ground-substance is homogeneous or fibrillary. The fibrillation is due to the penetration of the nutrient fluid. Embryonic cartilage changes directly to hyaline cartilage, in which the cells lose their protoplasmic prolongations and are surrounded by a capsule. A portion of the ground-substance is probably derived by the direct transformation of the cells. In mature hyaline cartilage of mammals and the human species the cells do not send forth the processes as in the embryo. In the ground-substance one can often see fine fibers, passing from cell to cell; these fibers are not artefacts. The nutrition of cartilage is effected by nutrient fluids which leave the vessels and enter the cartilage along these fine fibrillas.

The Role of Atmospheric Pressure in the Hip-joint.—Since the contribution of the Weber brothers in 1836 on the anatomy and physiology of the hip-joint, calling attention to the negative air-pressure as an important factor in supporting the head of the femur in the socket, various authors have held this to be one of the main supports. Seabury W. Allen¹ overthrows this theory and believes that the cotyloid ligament is the principal support, then the capsular ligament, and the air-pressure need not be considered.

A New Muscle of the Eye (*Musculus papillæ opticae*).—G. Nicolai² has observed at the head of the optic nerve of man and several animals a muscle consisting of circular, longitudinal, and radiary fibers. Further investigation upon this subject will inform us whether the author did not mistake the mesodermal structure of the elastic coat of the artery for muscular fibers.

Congenital Absence of Both Inferior Recti Muscles.—Edw. Stieren³ reports the case of a child who when asked to look down flexed his head upon the chest, the eyes not moving below the horizontal plane. Operative interference disclosed the absence of the inferior rectus of the right eye. Although the left side was not operated upon, the author concludes that this case was one of binocular congenital absence of the inferior recti. He was unable to unearth a similar case in the literature.

A Complete Absence of the Superficial Flexors of the Thumb and Concurrent Muscular Anomalies.—W. S. Hall⁴ records the case of an anomalous condition of the muscles of the thumb. The thenar eminence was less prominent than usual, which was due to the complete absence of the abductor pollicis, the opponens pollicis, and the superficial head of the flexor brevis pollicis. After removing the skin the entire metacarpal bone of the thumb was exposed. Moreover, the short stout branches of the median nerve and the superficial palmar arch were absent. The tendon of the extensor ossis metacarpi pollicis was double and from the external tendon a small quadrilateral muscle 15 mm. square passed transversely inward and was implanted in the superficial aspect of the anterior ligament. This slip together with the extensor ossis

¹ Boston M. and S. Jour., April 9, 1903.

² Ann. d'Oculist., Nov., 1902.

³ Amer. Med., April 11, 1903.

⁴ Jour. Anat. and Physiol., April, 1903.

metacarpi muscle provided a functional compensation for the missing group.

BLOODVESSELS AND LYMPHATICS.

Notes on the Topographical Anatomy of the Operation of Making an Anastomosis between the Portal Vein and the Ascending Vena Cava.—G. Russo-Travali¹ directs as follows: The abdomen being opened, the edge of the liver is lifted up and the colon pushed down, The cysticoduodenal ligament is then exposed, and the part of the duodenum looked for which embraces the head of the pancreas. The hepatoduodenal ligament is next sought. The anterior layer of this peritoneal structure is then divided and the ducts and hepatic artery are then pushed aside to expose the portal vein, which is freed as far as possible from the margin of the pancreas to the hepatic sulcus. The vena cava is situated on a deeper plane, being exposed by pushing aside the hepatoduodenal ligament and the duodenum, and is covered by the posterior layer of the peritoneum. The portion of the vena cava between the renal veins and the spermatic or ovarian vein is the best for the anastomosis. On the right and externally, this portion is in relation with the right kidney and ureter, internally with the aorta, in front with the third portion of the duodenum, and behind with the lumbar vertebrae. The lumbar veins which enter the vena cava from behind should be remembered when applying forceps to the wounded vena cava. Sometimes the right renal vein is inserted in front of the vena cava.

The Existence of an Unknown Blood-supply to the Embryonic Stomach.—Broman,² in his studies on the development of the omental bursa and neighboring structures, observed one, two, or more branches of the ductus venosus arantii running through the attachment of the omentum minor into the mesodermic stomach-wall, in which they form a dense network. Those branches of the celiac axis, which anastomose with this plexus, seem to be slightly developed at this period. They were never found in older embryos, probably obliterating with the spreading and thinning out of the lesser omentum. He considers these vessels of great importance in the development of the stomach, and gives the following reasons: (1) an organ shows the greatest growth when its nutrition is the best; (2) that during the existence of these veins the stomach displays its greatest growth (the time that its breadth increases beyond that of the other parts of the alimentary tract); (3) the ductus venosus supplies the most nourishing blood (direct from the placenta); (4) these branches from the ductus venosus are short and direct. He has found these veins in the embryo of the pig and cat, also chicken, turtle, and Necturus embryos, and is under the supposition that they exist in all vertebrates with well-developed stomachs.

The Branches of the Superior Mesenteric Artery to the Jejunum and Ileum.—Thomas Dwight³ states that the number of branches of the

¹ *Riforma Medica*, April 15, 1903.

² *Anatom. Anz.*, July 30, 1903.

³ *Anatom. Anz.*, May 15, 1903, p. 184.

superior mesenteric artery from the left side is very variable; there may be 20, but of these only 6 or 7 are of considerable size. The first one is generally small and is followed by 4 to 6 larger ones, arising near together and supplying the upper half of the small intestine; the remainder are smaller. The first two or three divide into an ascending and a descending branch, each of which inosculates with the corresponding branch of the neighboring artery, thus forming a single row of arches, from which the straight vessels descend to the border of the intestine. Near the beginning of the small intestine we notice a frequent modification of the plan of the arches, small loops connecting them near their origin. The parallel vessel is formed chiefly by the subdivisions of the primary branches, and slightly by the connecting-links. The next modification to occur is that branches may give off secondary branches from their sides, which subdivide and at their ends anastomose with the primary branches. Lower down in the intestine secondary loops of bifurcation become more frequent, and near the beginning of the second quarter of the small gut we often find an approach to a second tier of arches. While the vessel diminishes in size the arches become more complex. Toward the end of the ileum the arrangement is uncertain. There is a free anastomosis between the termination of the superior mesenteric artery and its ileocolic branch. The system of straight vessels extends throughout the jejunum and ileum from the parallel vessel to the gut. At the jejunum they are numerous and large, having a length of 45 cm. and occasionally branch. Anastomoses practically never occur between them in the mesentery. Most frequently the entire vessels are distributed alternately to one side or the other of the gut, although they may divide at the gut, sending one branch to either side. After the first third of the small intestine the straight vessels are smaller and shorter, but still characteristic, although at the end of the ileum they become small and very irregular.

Topographic Anatomy of the Bronchial and Tracheal Lymph-glands.—W. Sukiennikow¹ states that the appearance and arrangement of the tracheal, bronchial, and pulmonary lymph-glands are subject to certain regular rules. The synoptical relations of the trachea and bronchi produce 3 inclosed spaces which are filled with tracheobronchial lymph-glands. The bronchopulmonary lymph-glands are always found in the angles of the bronchi or their branches, the same as in the bronchotracheal glands. From their relation to the trachea, the bronchi and their branches, and to the lungs, and from their absorption of the lymph from these organs, two main systems of lymph-glands are recognized: (a) Tracheobronchial lymph-glands, subdivided into right, left and inferior or bifurcational tracheobronchial glands; (b) bronchopulmonic, subdivided into the eparterial, ventrales dextra I, ventrales sinistra I, ventrales dextra II, etc., corresponding to the bifurcation. Enlargement of the right tracheobronchial glands will push the right vagus toward the lung. The left vagus is not closely related to its respective set of glands. The inferior laryngeal nerve is affected by the swollen gland

¹ Berl. klin. Woch., April 6, 1903.

under the aorta and under the thyroid gland. The predominance of the anterolateral position of the lymph-glands, especially of the tracheo-bronchial glands, makes percussion a doubtful factor in the diagnosis of enlarged glands.

The Relations between the Lymphatics and the Connective Tissue.—The question of anastomoses between the lymphatics and the lymph-spaces, "Saftkanälchen," is considered by W. G. MacCallum,¹ who comes to the conclusion of Ranvier, that the lymphatics end blindly and present no stomas. The Saftkanälchen are not spaces, but are due to the separation of cells and intercellular substance, and these tissue-spaces are variable instead of being definite cavities lined with endothelium. By injecting the lymphatics with silver the endothelial lining behaves similarly to that of the bloodvessels, presenting no pores or holes, except some artefacts due to trauma. Solid matter is taken up by the lymphatics through the agency of phagocytic leukocytes, which have the power to enter or leave the bloodvessels or lymph-vessels by their independent mobility. The lymphatic system is produced by long-continued sprouting of blind tubules from the bloodvessels. Lateral branches are formed from a single row of endothelial cells by sprouting of swollen and dividing end-cells.

Relation of the Lymphatics of the Peritoneal Cavity in the Diaphragm and the Mechanism of Absorption of Granular Materials from the Peritoneum.—W. G. McCallum² concludes from his study on the diaphragm of dogs that the peritoneal endothelium is a complete and unbroken layer of cells, not presenting stomas as described by v. Recklinghausen, but the cells have power to retract from one another, as Muscatello, Kolossowo, and others have shown. The lymphatics of the diaphragm form a dense layer beneath the endothelium. The radial trunks are embedded between the musculature of the diaphragm and anastomose freely with the pleural lymphatics. This leaves only a continuous layer of endothelium between pleura and peritoneum. Granules, however, enter the lymph-channels of the diaphragm, later appearing in the mediastinal lymph-glands. After injecting granules into the peritoneal cavity, there appeared in a short space of time phagocytic leukocytes, each laden with a granule, forcing their way between the cells, then lining the lymph-channels of the diaphragm into the mediastinal glands. This process is somewhat accelerated by the respiratory movements. After excluding all life from cells by heat or chemicals, there still occurred some absorption, which was demonstrated by the outline of granules around the epithelial cells.

Lymphatics of the Ureter.—The investigations of K. Sakata³ upon the lymphatics of the bladder and kidney, which are of importance regarding the theory of ascending infection, brought him to the conclusion that the organs have no direct lymphatic connections, but through the anastomosing of the glands or through the lymphatics of the ureters. The lymphatics of the ureter are situated apparently only in the muscular

¹ Bull. Johns Hopkins Hosp., Jan., 1903.

² Anatom. Anz., May 6, 1903, p. 157.

³ Arch. f. Anat. u. Phys., 1, p. 1, 1903.

coat and on the surface. The lymphatics of the lower ureter lead to the hypogastric glands or to the lymphatics of the bladder. Those of the middle ureter run to the lumbar glands, while those of the upper part are seen to take a course toward the aorta or anastomose with the lymph of the kidney.

VISCERA.

Liver-cell.—Schlater¹ gives his version of the architecture of the liver-cell. Browicz and the author are of the opinion that the liver-cell is a complicated morphologic structure analogous to an organ. The parenchyma is made up of a structureless ground-substance through which fibrillas run and granules (cytoblasts, Arnold) are found. The fibrillas contracting on the parenchyma of the cell move the erythrocytes and hemoglobin toward the nucleus through the ground-substance. Schlater considers the nucleus to be made up of two ellipsoid bodies having a common axis; the smaller body being contained in the larger one. This internal body presents a clear unstained space, whose function he is not able to state. Between the surfaces of the two ellipsoids 6 nuclear granules are constantly found, which have fixed positions. One granule is found at each end of the common axis, the other 4 being situated at the corners of a square, perpendicular to the long axis and through the center of the ellipsoid.

Lymph-canalliculi of Cells of Liver and Suprarenal Body.—Emil Holmgren² discusses the "Saftkanälchen" (lymph-canalliculi) of the liver-cells and of the epithelial cells of the suprarenal body. In an earlier essay he considered that the canalliculi belonged to a trophospongiosum, and that the intracellular canals are not connected with the bile-capillaries. Browicz, and the author both called attention to these intracellular structures. The bile-capillaries possess tail-pieces. From the epicellular spaces canals penetrate the cell more or less; some of these reaching the nucleus, but never penetrating it. Browicz claims that the bile-capillaries have their origin in the nucleus. They can easily be distinguished from one another; the nutrient canals are of a light color and are continuous with the perivascular interstices and never in direct contact with the intercellular bile-capillaries. The bile-capillaries can easily be recognized by their tails. Holmgren has also demonstrated the lymph-canalliculi in the suprarenal body. Holmgren is of the opinion that in these nutrient canals fermentative processes occur whose products are granules or drops (vacuoles).

The Cardiac Glands of Mammals.—R. R. Bensley³ concluded from his examinations of the cardiac glands of man, pigs, and gnawing animals that the cells were mostly mucous with few chief or parietal cells, contrary to the opinion of the German school. Toward the fundus the chief and parietal cells grow still scarcer. He believes that the cardiac glands are regressive fundus glands in which the most essential parts have

¹ *Anatom. Anz.*, Nov. 24, 1902, p. 249. ² *Anatom. Anz.*, Sept. 20, 1903.

³ *Am. Jour. Anat.*, p. 105, 1902.

degenerated. This degeneration he attributes to the mechanical irritation from the entrance of food.

The Relations between the Suprarenal Body and Growth of the Body.—P. Linser¹ reports the case of a boy 5½ years old of gigantic structure who gave the appearance of a youth of 16 to 18 years. An inoperable tumor was found in the left renal region which at autopsy proved to be a malignant tumor of the suprarenal body. The author believes that the glands of the blood, under which are included the thyroid, hypophysis, thymus, suprarenal bodies, and genital organs, have a certain close relation among themselves. They can influence the function of one another and also the growth of the body. In giants we generally observe tumors of these glands, while in dwarfs hypoplasia or aplasia is observed.

Gallbladder.—In his article Brewer² states that in the lower portion of the S-shaped curve of the gallbladder Hartmann has described a large semilunar fold attached to two-thirds of the circumference of the wall, the center of attachment being on the right. Beneath this, arising from the left side or promontory, at the upper arm of the curve, is another but smaller valve. Between these two valves a space called by Hartmann "le bassin de la vesicule," or the pelvis of the gallbladder, is found.

The Form of the Human Spleen.—R. K. Shepherd³ recalls the fact that the normal spleen shows enormous variations in size and shape. The parietal surface, the surface next to the diaphragm, is quite constant in its form, but the visceral surface, which contains a number of areas, usually 2 or 3, the renal, the gastric, and the basal or colic surfaces of Cunningham, varies considerably. Two chief types of spleen are met with in hardened subjects. In the first type, the segmental, it is shaped like the segment of a pear with a parietal surface and two visceral areas, the renal and gastric. In the second type this organ is shaped like an irregular tetrahedron having a parietal surface and three visceral areas, the gastric, the renal, and the colic areas, which meet at a point, the intermediate angle or the apex of the tetrahedron. The gastric and renal areas are always separated by an intermediate border. The gastric area is marked off from the parietal area by a distinct border, while the renal area is separated from the parietal surface by a border, the posterior. These are the only borders found in the segmental type. In the tetrahedral type three secondary borders are met in addition to those described above. The types are due to the state of distention of the surrounding organs. When the stomach is distended and the colon is empty, we have the segmental type; when the conditions are reversed, we have the tetrahedral type. A tubercle is often found on the intermediate border; when found, the border below is very much flattened. This tubercle is probably due to the relationship of the tail of the pancreas. A process of peritoneum is seen in the tetrahedral type passing over the anterior angle of the spleen, the origin of which is unknown. In some spleens a lienophrenic ligament is observed.

¹ Beitr. zur klin. Chir., xxxvii, p. 282, 1903.

² Med. News, May 2, 1903.

³ Jour. Anat. and Phys., Oct., 1902, p. 50.

The Position of the Gallbladder.—S. Carmichael¹ finds that the generally accepted statement that the gallbladder is found lying opposite the ninth costal cartilage is erroneous in 75 % of cases. The position of the ninth costal cartilage itself varies on account of differences in its length and direction. He believes that the gallbladder should be located by a vertical line, dropped from the middle of the clavicle, which will generally cross some part of the fundus. The fundus lies from 1 cm. to 9 cm. outside of the right lateral line described by Addison in 90 % of the cases observed by Carmichael.

Division of the Left Auricle of the Heart by a Fibrous Band.—T. Waldrop Griffith² in his description says that the left auricle was divided into 2 compartments by a broad fibrous band, which started from the auricular septum, where it was continuous with the tissue of the valvula foraminis ovalis, from which it arose by several spurs. This band passed upward and forward below the upper right pulmonary vein, then along the anterior and left walls of the auricle and below and in front of the left pulmonary vein, and becoming narrower, was lost on the posterior wall of the auricle. The concave margin formed about two-thirds of the aperture between the two auricles, which admitted 2 fingers. At the auricular wall several small apertures were observed. Griffith is of the opinion that this anomaly is due to the failure in the complete amalgamation of that part of the auricle which is supposed to be formed from the confluent portions of the pulmonary vein and that derived from the left-hand division of the common auricle of the embryonic heart.

Anatomy of the Pancreas.—The surgical importance of the pancreas at the present time renders a consideration of its anatomy, embryology, and anomalies of practical interest. E. L. Opie³ has always found two ducts present. The common duct always joined the duct of Wirsung, while the duct of Santorini emptied into the intestine above. In 10 cases out of 100 the ducts failed to anastomose with each other in the gland, and in 4 only minute anastomoses existed. In 28 instances the duodenal end of the duct of Santorini was not patent; therefore in one-third of cases this canal cannot act as an accessory duct, if the duct of Wirsung is occluded. In 11 cases out of 100 the duct of Santorini was as large or larger than that of Wirsung. The head is composed of two lobes, an anterior and lower one, tributary to the ductus Santorini, and a posterior lobe, tributary to the duct of Wirsung. They are divided by a cleft, filled by adipose tissue. Helly has found within the papilla of the ductus Santorini lobules of pancreatic parenchyma situated immediately below the duodenal mucosa; they constitute a true accessory pancreas. Helly found this pancreatic tissue to develop very early in embryonic life from lateral branches, which bud from the duct as it passes through the mesoblastic layers of the intestinal wall. Opie believes this process to be responsible for aberrant pancreatic tissue embedded in the wall of the stomach or intestine. He has found this anomaly in 10 out of 1800 cases. Opie is of the opinion that at a very

¹ Jour. Anat. and Physiol., Oct., 1902.

² Jour. Anat. and Physiol., April, 1903.

³ Amer. Med., June 20, 1903.

early period of embryonic life a lateral branch of the pancreatic duct entangled in the mesoblastic layer of the intestinal wall is carried by longitudinal growth of the intestine away from the pancreas and a new duct is formed. The pancreas consists of two functionally diverse elements, cells of secreting acini which supply to the intestine important digestive ferments and cells of the islands of Langerhans, which have no communication with the ducts of the gland, but are in intimate relation to the bloodvessels, through which medium they exert their effect upon carbohydrate metabolism.

The Development of the Islands of Langerhans in the Human Embryo.—Richard M. Pearce¹ made observations on embryos varying in age from 7 weeks to 7 months. In 7 weeks' embryos there is seen on the periphery of the tubules a distinct proliferation and differentiation of cells. These areas lie in the concavity of the tubules and show at 8 to 10 weeks evidences of vascularity. At the end of 3 months these processes are separated from the acini, and a solid mass of cells connects the islands with the gland acini. There is distinct vascularity, the vessels coming from all sides. This stage is followed by complete separation of the island from the gland by connective tissue. In a syphilitic embryo of 3 months the connective tissue showed great development, probably arresting the development of the gland.

The Normal Appendix: Its Length, Its Mesentery, and Its Position or Direction, as Observed in 656 Autopsies.—George H. Monks and J. Bapst Blake² give statistics the results of which form the following conclusions: The average length of the appendix in men, women, and children is 7.9 cm., the extremes being 1 cm. and 24 cm. No relation exists between length of body, age or sex, except that children are apt to have an appendix proportionately larger than adults. Fully one-half of all appendixes have a mesentery which reaches nearly to the tip. The other half have mesenteries reaching as far as the middle of the appendix or beyond. Occasionally an appendix is devoid of any mesentery. The commonest position for the appendix is down and in, that is, toward the pelvis, the appendix frequently hanging over the brim of the pelvis. After this it is most frequently found behind the cecum, then in a downward direction, and then inward. The appendix is in one of these positions in three-fourths of all cases.

Determination of the Duodenum by the Glands of Brunner.—Konrad Helly³ gives a new method of determining the length of the duodenum by the glands of Brunner. There may be difficulties in recognizing the boundary between the duodenum and jejunum in the cadaver due to abnormalities in this situation, among which may be mentioned the occurrence of a so-called free duodenal mesentery, and an opposite condition, the fixation of the beginning of the jejunum to the posterior abdominal wall, and the formation of abnormal duodenal loops. Normally the attachment of the suspensory muscle of the duodenum and the crossing of the superior mesenteric artery and the small

¹ Med. News, April 4, 1903.

² Boston M. and S. Jour., Nov. 27, 1902.

³ Anatom. Anz., Jan. 19, 1903.

intestine occur in the same location and indicate the duodenojejunal junction. In the absence of this duodenojejunal flexure, Broesicke, His, Toldt, and Oppel have determined the length of the duodenum by different methods. Oppel, Gegenbaur, Henle-Merkel, Langer-Toldt, Stoeher, Rauber, and v. Ebner have given various distributions to the duodenal glands, most of them finding them to be distributed thickly around the pylorus, diminishing in number in the descending loop, past which they are seldom found. Boehm and Davidoff state that the entire duodenum is lined with Brunner's glands. In 14 normal duodenums Helly has always obtained the same constant result. The glands of Brunner, thickly distributed at the pylorus, decrease in number up to the entrance of the bile-duct, from where they grow scarcer, and cease at the duodenojejunal flexure. In his fifteenth case he found a duodenum with a free mesentery and no attachment to the posterior abdominal wall. Only a superior horizontal and a descending portion could be recognized. The suspensory muscle of the duodenum was absent. Measurements gave no satisfactory results. Upon histologic examination it was found that the lowest glands were found at a point 14 cm. from the pylorus, which point corresponded to an artificially produced duodenojejunal flexure. He suggests, therefore, that the lowest limit at which the glands of Brunner can be found be regarded as the end of the duodenum.

The Nature and Anatomy of Enteroptosis (Glénard's Disease).—Arthur Keith¹ from an anatomic standpoint assumes that enteroptosis is the result of a vitiated method of respiration, either from yielding of the thoracic support or the weakening of the abdominal. The muscles of the crus of the diaphragm whose spinal attachments tend to pull this organ down, are most important factors in producing ptosis. The diaphragm has 3 supports—the abdominal, thoracic, and costal, of which the thoracic is of more importance than is generally believed. It supports the center of the diaphragm by the attachment of the crus muscles to the heart, pericardium, great vessels, and lungs, which directly or indirectly attach the upper surface of the diaphragm to the structures at the root of the neck and to the whole extent of the thoracic wall. Each contraction of the diaphragm has to overcome the thoracic support. Too much importance is given to the passive bands which fit the viscera to the abdominal wall. The extrusion of viscera from the subdiaphragmatic space is attributed to the constricted thorax pressing on the epigastric region, which prevents the stomach and liver from swinging forward, and depression of the ribs, which displaces the costal fibers of the diaphragm vertically, exerting a downward pressure upon the abdominal viscera. The disused abdominal muscles are not able to counteract the diaphragm after the constriction is released.

¹ *Lancet*, March 7, 1903.

NERVOUS SYSTEM.

Nucleus Salivatorius of Chorda Tympani.—Kohnstamm¹ was able to demonstrate in the dog degenerative changes in a group of cells in the medulla after section of the fibers of the chorda tympani which pass to the submaxillary gland. He suggests the name "nucleus salivatorius" for these cells, inasmuch as they are to be regarded as the origin of fibers ending in the submaxillary ganglion. This group of cells extends from just in front of the posterior extremity of the nucleus facialis to the anterior extremity of the motor root of the fifth nerve; they are distributed over a considerable area. The cells resemble the motor cells of the anterior horns and of the cranial nerve-nuclei. The fibers issuing from them decussate and leave the brain as the nervus intermedius Wrisbergii. This nucleus salivatorius is supposed to innervate all the salivary glands. It would seem proper to regard the nervus intermedius, whose peripheral portion is called chorda tympani, as an independent sensorimotor cranial nerve.

Structure of the Choroid Plexuses.—Catola² has investigated the choroid plexuses by the Weigert method of staining and finds 2 kinds of neuroglia fibers entwined in a ring-like manner about the bloodvessels. He describes 3 layers of tissue in the plexuses: An epithelial layer, a layer of neuroglia, and the connective-tissue and bloodvessel layer. The first two are remnants of the original brain tissue, while the third is derived from the pia mater; the arachnoid does not enter into the formation of the plexuses according to the author. J. Mamura,³ however, describes the arachnoid as taking part in the formation of the plexuses.

A Study of the Cerebral Cortex in a Case of Congenital Absence of the Left Upper Limb.—Macroscopic comparison of both hemispheres of a man whose left lower arm was congenitally absent disclosed no greater difference than exists between normal hemispheres. Moorehead⁴ believes that the differences found by Gowers, Bastian, and Hornby were within the normal variations.

The Extent of the Surface of the Cerebellum.—Kreuzfuchs⁵ finds that the total surface area of the cerebellum is 84,246 sq. mm.; of this area the concealed portion is 4 times as great as the free area. In the cerebrum the concealed area is about twice as great as the free area. The number of Purkinje's cells was estimated at over 14,000,000.

Structure of the Dura Mater Cerebri.—S. Nose⁶ finds that the outer layer of the dura is covered with a layer of large cells, which are to be looked upon as modified connective-tissue cells. In the child there is a single layer of these cells, whereas in the adult there are several. Directly beneath these cells is an elastic membrane, which increases in thickness up to the twentieth year. Nose confirms the statement that the dura is rich in elastic fibers. The vessels of the dura show a pro-

¹ *Anatom. Anz.*, xxi, 1902.

² *Riv. di patol. nerv. e mentale*, 1902, No. 9.

³ *Arbeit. aus Prof. Obersteiner's Laborat.*, 1902, Heft 8.

⁴ *Jour. Anat. and Physiol.*, Oct., 1902.

⁵ *Arbeit. aus d. Neurolog. Institut. a Wiener Univ.*, ix, 1902, p. 274.

⁶ *Arbeit. aus Prof. Obersteiner's Laborat.*, 1902, Heft 8.

gressive thickening of the media, beginning at the thirtieth year. The dura is more vascular in adults than in children, the parietal layer being more vascular than the visceral. Nerves are also abundant. The pachionian bodies are more numerous in adults than in children, the nuclei are less abundant, and the connective tissue has proliferated.

A Further Note upon the Prepyramidal Tract (Monakow's Bundle).—After destroying the tract between the optic thalamus and the crossing of the pyramids in apes and cats, E. H. Fraser¹ concluded that the fibers of Monakow's bundle (descending motor cortico-tegmental fibers) have their source in the red nucleus of the tegmentum. In apes it is narrower and less diffuse than in the cat, in which the fibers of the crossed pyramidal tract intermingle quite freely with those of Monakow's bundle. The collaterals of the bundle fibers enter on the sides of the anterior horn in the gray substance, and end in the cells of the anterior horns. Fraser did not observe any ascending fibers in Monakow's bundle.

A Study of the Brain-weights of Men Notable in the Professions, Arts, and Sciences.—Edward Anthony Spitzka² says that heavy brains of idiots, imbeciles, and others of that class, and of ordinary laborers can nearly always be explained by pathologic hypertrophy, either congenital or acquired, as abnormal development of the neuroglia with diminution of ganglion-cells, or abnormal gyral development. The recent studies on the brains of scientists, including the brains of Hugo Gylden, Kowalewski, Helmholtz, the composer Lentz, Gambetta, and others, show that the index of an individual's prominent characteristics is to be found in certain individual peculiarities in the development of one or another cortical region. The higher developed the individual, the greater power of association will be possessed by the mind, and superior development and arrangement of the gyri and special cortical fields will be observed. The weight of the brain is influenced by senile atrophy, fluid in the ventricles, blood, etc., at the time of autopsy. The average weight of 96 brains of eminent men was greater than that of 100 ordinary brains. Donaldson calls attention to the fact that the decrease of brain-weight in senile persons is deferred a decade in the highly intellectual class. Men of exact science have the heaviest brains, then the natural scientists, followed by men of fine art, philosophy, etc., then "men of action," government employees, politicians, military men, etc.

The Cerebrum of a Microcephalic Idiot.—N. C. McNamara³ reports the case of a microcephalic idiot whose cranial development was of a low type and whose cerebrum was insignificant. He was unable to speak, but expressed his wants by signs. He was entirely devoid of intelligence, but seemed to appreciate the sound of music. His sight and sense of smell and hearing were good. His head measured $7\frac{1}{4}$ inches from the glabella to the occipital protuberance, and $8\frac{1}{4}$ inches from the tip of one mastoid to that of the other. The brain weighed $12\frac{1}{4}$ ounces, and the cerebellum projected $\frac{3}{4}$ inch beyond the occipital lobe. The

¹ Jour. of Phys., Sept. 12, 1902.

² Phila. Med. Jour., May 7, 1903.

³ Jour. Anat. and Physiol., April, 1903, p. 258.

stems of the sylvian fissures and their posterior horizontal limbs are alone present. The posterior ramus of the sulcus of the right side is nearly at a right angle with the cerebrum; on the left side it has an angle of 65° . In the left hemisphere the orbital and frontal opercula are wanting and the frontoparietal operculum is imperfectly developed. In the right side this condition of the opercula was marked. The island of Reil consists of a small smooth nodule presenting no gyri or sulci except a semblance of a longitudinal fissure. The frontoorbital sulcus is well defined, and forms the anterior limiting sulcus of the island of Reil, the same as in anthropoid apes; in fact, the cerebrum resembles that of a full-grown chimpanzee. That portion of the cerebrum posterior to the central sulcus shows the most marked anomalies. The callosomarginal sulci cut into the superior border of the hemispheres posterior to the upper end of the central fissure. The intraparietal sulci are of an ape-like character. The parietooccipital sulci, especially the left one, pass into fissures corresponding to the "Affenspalte" of the ape's cerebrum, but there is no occipital operculum. The temporal lobes project but little beyond the inferior terminal portion of the great limbic lobe; they present only 2 distinct sulci. This brain corresponds more to that of an adult chimpanzee than to a human cerebrum. The absence of speech can be attributed to the presence of only rudiments of the opercula of the third frontal gyrus of the left hemisphere and the insula.

GENITOURINARY TRACT.

Two Cases of Complete Bilateral Duplication of the Ureters.—In A. H. Gould's¹ cases of this rare anomaly the kidneys of both sides presented 2 pelves, from each of which 2 distinct patent ureters ran and were separate throughout their entire course. Each ureter had a separate orifice in the bladder.

The Curve of the Fixed Portion of the Urethra.—Many authors have endeavored to give accurate mathematic descriptions of this portion of the urethra, among them Kohlrausch, Engel, Henle, and Testut, all of whom differ. Fr. Merkel,² investigating the literature upon the subject, could not find the reasons for this variance. Testut described 3 portions of the fixed urethra, one portion anterior, another posterior, to the urogenital diaphragm, and that part inclosed by the diaphragm. That portion anterior to the diaphragm is controlled by the ligaments of the penis and the amount of fat in this region. The part posterior to the diaphragm is also quite mobile, depending upon the fulness of the bladder and rectum. Garson demonstrated that filling the rectum raises the bladder. As the urethra remains fixed in the diaphragm, the intrapelvic portion stretches as the bladder rises, and the prostate is elongated. The more the bladder is pushed forward, the more the prostate will be displaced, consequently the angle of the urethra will be more acute. When the rectum is empty, the fluid in the bladder plays an important role. If the bladder is empty, the curve is flat;

¹ Am. Jour. Med. Sci., March, 1903.

² Anatom. Anz., June 24, 1902.

on the other hand, if it is filled, it presses on the prostate and the urethra; the gland is flattened while the urethra is shortened. In cases of simultaneous dilation of both the rectum and bladder the curve remains the same as if the organs were empty. A curve of the urethra in the position described above will correspond to the arc of a circle whose radius is 25 cm. long, and whose center is located on the posterior surface of the symphysis pubis, at the upper border of the lower quarter. The greater portion of the arc is included in the intrapelvic portion, which flattens out to a slight degree posteriorly near the bladder. The true stationary urethra does not lie under the symphysis pubis, but in a line corresponding to a tangent to the posterior surface and 15 mm. below the symphysis. He claims that it is impossible to give an accurate length of the posterior portion as Sappey and Testut have done.

A Case of Genuine Hermaphroditism.—Aside from the malformation of the external genitalia, this case, reported by Garre,¹ presented a hernia-like protrusion of the left inguinal region, whose contents consisted of a testicle, epididymis, spermatic cord, ovary, tube, and parovarium. These organs were recognized microscopically. Rectal examination revealed a band, extending from the urethra to the left linea temporalis, where two bodies the size of pigeon-eggs could be palpated, probably ovary and testicle. This is most likely a case of true bilateral hermaphroditism. Microscopic examination of the testicle showed the characteristics of a retained inguinal testicle, retrograde changes, and the absence of spermatogenesis. In the ovary primary follicles could be observed.

True Hermaphroditism.—W. Simon² reports the case of an individual 20 years old growing up as a boy who desired to develop into one of the male species. His breasts were well developed, and during the last 3 years they became swollen at intervals. At regular periods of 4 weeks blood would appear at the genitals. For a number of years he had become sexually excited by females, having erections and a discharge of semen containing no spermatozoa. At the symphysis a cylindric penis-like body of 4 cm. length and 6.5 cm. circumference with a distinct nonperforated glans existed. From the end of the glans to its base there was a linear ridge with plainly visible canal. From this organ two labia-like bodies covered with hair, which were united at the base by a broad commissure, descended. A narrow strip of skin was found between these elevations, in the middle of which on a sagittal summit the orifice of the urethra was observed, leading into the bladder. An incision in the right inguinal region revealed a tumor consisting of testicle, epididymis, ovary, tube, and parovarium.

MISCELLANEOUS.

Note on the Framework of the Thyroid Gland.—Flint³ is of opinion that large septums of framework do not divide the thyroid

¹ *Anatom. Anz.*, March 17, 1903, p. 27.

² *Virchow's Archiv*, clxxii, 1, p. 1, 1903.

³ *Johns Hopkins Bull.*, Feb., 1903.

gland into lobes or lobuli. The bloodvessels and connective tissue make up the largest portion of supporting framework. The organ is made up almost entirely of follicles, which are embraced by the connective tissue, retaining their form and relations. The follicular membrane is a fine delicate structure, with a suggestion of fibers. It is somewhat thickened where 2 follicles meet, while at nodes where 3 follicles come together a pyramid of framework is found. Small arterioles, venules, and capillaries can be observed in the interfollicular network. The reticular membrane is traversed by small fibrils outlining the fascicular spaces. Between them considerable interfollicular connective tissue, which is distributed chiefly around large vessels, is found. The fasciculi accompanying these vessels are generally parallel to them, although many interlacing and circular fibrils are given off to give strength and elasticity to the gland.

Hibernating Gland in Human Embryo.—Hatal¹ has discovered in human embryos a gland corresponding to the hibernating gland of lower mammals. This organ, termed provisionally interscapular gland, was found only in embryos. It can be divided into (1) an enlarged anterior portion, beginning below the parotid gland under the sternocleidomastoid muscle, and running downward and backward along the neck, between the internal jugular vein and the levator scapulæ and splenius capitis muscles to the superior border of the scapula; and (2) a lower narrow portion, running downward beneath the scapula or near its vertebral border. The gland is composed of lobes and lobules, which contain 2 constituents, an outer fatty tissue and an inner lymphoid structure, which is surrounded by a thick fibrous membrane. The lymphoid structure contains adenoid tissue, between which blood and lymph-sinuses run. This organ corresponds in some respects to the so-called hibernating glands, and also to the hemolymph organs.

The Submaxillary Gland.—v. Smirnow² states that the human submaxillary gland is a seromucosalivary gland, consisting of serous glands between which are distributed islands of mucous alveoli and saccules. The mucous glands are in the minority, therefore it should be considered as an albumin-producing gland. The loose connective tissue of the lower jaw surrounds the gland, following the vessels and ducts from the hilum, and giving off septa, which divide the parenchyma into lobes. Through the interlobular spaces we find the connective tissue dense and plentiful. The cell-elements observed among the connective-tissue fibers include plasma and mast-cells, fat-cells, "Wanderelemente" of the blood and lymph, and smooth muscle-cells in the wall of the main excretory duct of the gland. Elastic fibers are present in the connective tissue of the excretory ducts and the accompanying bloodvessels and lymph-vessels, also around the glandular alveoli and canaliculi, but especially around the larger interlobular ducts. Here the fibers generally run parallel to the duct. Around the ducts the elastic fibers are observed next to the epithelium and in the adventitia. Along the salivary canaliculi elastic fibers are observed in great quantities in the connective-tissue formation of the walls, of which the greater portion is found subepithelial, running parallel to the

¹ *Anatom. Anz.*, July 4, 1902.

² *Anatom. Anz.*, March 17, 1903, p. 11.

canaliculi. Around the canaliculi anastomoses a rather firm plexus of elastic fibers is formed. In the smaller salivary canaliculi the connective tissue consists mainly of collagenous material, in which are found scattered elastic fibers, which have the same location and direction as the above. Around the mucous alveoli is found much elastic tissue, to which fact Livini called attention. He ascribes the presence of such a large quantity to the increased amount of power required to empty the thick slimy mucus.

Papillas in the Normal Conjunctiva.—Nakagawa¹ has constantly observed in horses, cattle, sheep, and pigs real papillas in the neighborhood of the cornea; beginning near the limbus from 5 to 10 are found. They begin at the outer border of the annulus conjunctivæ, where the epithelium of the cornea goes over into the thick epithelium of the conjunctiva and separates itself from the lower layer of the sclera. They may number from 4 to 13 and are placed about 2 mm. below and 1.5 mm. above the limbus in the conjunctiva bulbi. They are, on an average, 120 mkm. high and 80 mkm. broad. The human papillas can be differentiated from those of the domestic animals by their size and height. They consist of a dense superficial connective-tissue layer containing few muscles, while internally a loose fibrillary connective tissue is found which is rich in muscle. Each papilla contains a bloodvessel. The epithelium of the conjunctiva covers them and fills up the ridges between. These papillas have to be differentiated from papillary growths and follicles. The first are irregular swellings of the subepithelial adenoid conjunctival tissue; the follicles are subepithelial neoplasms having the appearance of lymphatic glands.

Structure and Development of the Posterior Layer of the Iris, Particularly the Sphincter Iridis.—v. Lenhossek² determines that the entire musculature of the iris, *i. e.*, both the sphincter and dilator pupillæ, are of epithelial (ectodermal) origin. The sphincter begins to be formed in the beginning of the fourth month and the dilator in the seventh month.

Nerve Terminals in the Extrinsic Muscles of the Eye.—Levinsohn³ found that in the majority of specimens examined the terminal nerve-fiber on approaching the end-plate divided into a considerable number of end-fibrillas each of which supplied a single primitive muscle-bundle. These end-fibrillas are inclosed in the sheath of Henle and have a diameter of 6 to 9 micromillimeters. They often pursue a tortuous course and may form several loops around a muscle-fiber. Often each end-fibrilla forms a separate end-plate, which does not fuse with adjacent ones. The nerves are very numerous; this is explained by the fact that the ocular muscles are in more constant use than other muscles.

Gland Tubules and Hassall's Corpuscles in the Thymus.—Schambacher,⁴ after examining carefully the thymus gland of numerous fetuses and of individuals dying at various ages, determined that there are to

¹ Arch. f. Augenheilk., xlvii, I, p. 51, 1903.

² Aus dem I Anatom. Institut. der Königl. Ungar. Univ. zu Budapest.

³ Aus dem Anatom. Institut. in Berlin. ⁴ Virchow's Archiv, Bd. clxxii, p. 368.

be found remnants of excretory ducts in this gland. He regards the concentric corpuscles of Hassall as formed from the epithelial contents of these gland tubules.

Transitory Epithelial Structures Associated with the Mammary Apparatus in Man.—H. E. Walter¹ discusses the epithelial thickenings discovered by Hugo Schmidt, which he interpreted as supernumerary mammary "Anlagen" on account of their distribution, their form, the time of their appearance, and no other plausible explanation. These thickenings have also been described by Schmidt, Strahl, Lichtenstein, v. Bardeleben, and others. In the cases of Schmidt and Walter, 40 of these "Anlagen" have been found, which is a greater number than in any known mammal; therefore the hypothesis of atavism can be excluded. Their arrangement to the mammary line, as also their configuration, speak against their being mammary Anlagen. A clew as to their origin can be obtained from the studies of Bresslau, who finds in the opossum that the development of the marsupial pouch is preceded by the formation of marsupial pockets around each milk point. These pockets appear at first as an irregular ring of thickened epithelium. Walter believes these pockets to be analogous to the structures of Schmidt, for the time of the appearance and disappearance of the temporary epithelial structures connected with the mammary apparatus in man, their grouping around the milk points, their arrangement with reference to relative width and length, and, lastly, their individual form, can be more clearly explained by the hypothesis that such structures are the remains of ancestral marsupial pockets than by considering them as "Anlagen" of supernumerary mammae.

The Subclavian Triangle.—Waldeyer² calls attention to the fact that upon full inspiration the structural relations vary. When the apices are pressed closely under the skin, as they are at full inspiration, the lungs are better approachable for diagnostic purposes. On account of the varying relations during respiration the bloodvessels are more easily injured at the height of inspiration, especially those on the left side, where the thoracic duct enters the subclavian vein. The thoracic duct not infrequently divides into several branches before emptying into the vein. In deep inspiration the apices of the lungs in the floor of the triangle are pressed closely against the skin, thus making them very approachable for diagnostic purposes. If clinicians would take advantage of these phenomena, fewer failures would occur in finding physical signs in incipient phthisis.

A Case of Siren Formation.—S. Abrahimow and M. Rjesanow³ describe a case of footless siren formation of a child 36 cm. in length, which expired 4 minutes after birth, and made several pendular movements with the legs. The skeleton presented the following anomalies: The spinal column was short, due to the absence of sacrum and coccyx. The pelvis was rudimentary. The ischii formed one bony mass, which

¹ *Antom. Anz.*, Oct. 10, 1902, p. 97.

² *Bonn*, 1903; *Med. News*, June 13, 1903.

³ *Virchow's Archiv*, vol. clxxi, 1903, p. 284.

filled up a great portion of the pelvis. The ascending rami of the ischium were absent, while the descending rami of the os pubes were synostosed. The ossa illei were flattened. The limbs were fused, the leg being short, while the feet were missing. The internal genitalia and rectum were rudimental. The external genitalia, bladder, ureter, and umbilical artery were absent. Instead of the latter a well-developed omphalomesaraic artery was found; hydronephrosis existed, due to the absence of the ureter. He attributes the malformation to a narrow caudal fold of the amnion.

A new method of staining the medullary sheath is described by v. Schrotter.¹ The sections, which are best hardened in Müller's fluid, are placed from 15 to 20 minutes in a freshly prepared cold solution of gallein (Grübler), which is prepared by boiling with well-water. Then differentiate in a 5 % solution of soda or weak sodium hydrate solution, then for a moment in a light violet permanganate solution. Wash with water, absolute alcohol, carbolxylol. The medullary substance will have a violet appearance, likewise the red blood-corpuscles; the gray substance and connective tissue will remain unchanged.

A Carmine Stain for Axis-cylinder.—Chilesotti² gives this formula: Mix 1 gm. sodium acid carmine (Grübler) with $\frac{1}{2}$ grain uranium nitrate and boil 12 hours with 100 cc. water. Filter and before using add 1 % hydrochloric acid. Sections from Müller's fluid will stain in 5 to 10 minutes; those from formalin, freezing paraffin, and celloidin in 15 to 20 minutes; from Weigert's neuroglia fluid in $\frac{1}{2}$ to 1 hour; from Marchi in 2 to 4 hours. Then treat with water, alcohol, carbolxylol.

¹ Cent. f. allg. Path. u. path. Anat., 1902, p. 299.

² Cent. f. allg. Path. u. path. Anat., 1902, p. 193.

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